The Builder.

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The West Ham Technical Institute Competition.

THE designs submitted in competition for the Technical Institute and Free Library for the Corporation of West Ham, seventy-three in number, have been on view during the present week at the Public Hall in Barking-road. After the recent discreditable affair of the Durham County Buildings, of which the last has probably not yet been heard, it is an agreeable task to have to record a competition like that of West Ham, which has been admirably conducted throughout, and in which there can be no question that the right design has been selected.

The West Ham building is to be erected on a site in Romford-road known as "The Green," and bounded by Romford-road on the south, Water-lane on the west, and "The Green" on the north; the east side of the site being partially defined by existing buildings. The new building was specified in the instructions to contain the usual departments of a Technical School—shops for engineering and building trades, chemical and physical laboratories, an electrical workshop, an art school, school of cookery, laundry, &c. Added to this a lecture-hall on the ground-floor, to accommodate 500 persons, and two smaller lecture-rooms for 200 persons each (the special object of these smaller lecture-rooms was not defined); administrative offices, lavatories, and other usual adjuncts. The Free Library department was to be capable of being managed and controlled separately from the Technical Institute, and to include a lending library, reading-room, reference library, book store, and librarian's office so placed as to enable the librarian to have easy control of all the departments. The whole of the library department was to be on the ground-floor, except some small rooms for binding-shop, store-rooms, &c. The principal entrance was to be in Romford-road, other entrances to be placed at the discretion of the competitors, and architectural style was to be left entirely to their discretion. The cost of the whole not to exceed 40,000*l.*

The Technical Institute department was also to include six class-rooms, and two rooms "for social purposes." In the subsidiary instructions, issued to give further information on a good many points on which information had evidently been asked for, it is stated that these two social rooms were to be one for men and another for women; an instruction which certainly ought to have been given in the first-issued paper, as the proper placing of these rooms on the plan would be materially affected by this consideration. Nothing was said in the instructions as to providing a separate entrance for women, but a considerable number of the competitors have assumed that such an entrance would be desirable, and have made separate entrances for men and women a feature in their plans, placing the women's entrance in contiguity to the departments which are generally supposed to be especially women's work, such as the laundry and cookery school. Practically they were probably right in this view; though theoretically it may be supposed (in the present day) that there is no reason why some women might not wish to enter the classes for engineering and building trades, and at all events they would be equally eligible with the other sex for the study of chemistry and for the art department, so it would hardly be possible that the separation of the sexes could be planned for entirely in the building; nor has any competitor, as far as we observed, attempted to do this.

It is evident that the position of the large Lecture Hall, which would be practically a hall for public entertainments for the district, must form one of the most important key-points in the arrangement of the plan; it is the central feature of the Institute portion. The other important point would be the relative positions of the Institute and Library portions of the building, which must form two independent sections. The site is approximately square, and has full access on three sides—north, west, and south; so that it is on the whole a favourable one for planning. The principal front, towards Romford-road, faces a little east of south.*

The plan of Messrs. Gibson & Russell, to whom the first premium has been awarded, is admirably arranged in almost every respect, and after looking pretty carefully through the whole set, we can see no other which has a claim to compete with it. The main entrance is in the centre of the Romford Road front, and the vestibule leads into a wide corridor running parallel with the front, with columns down the centre of it. Between this and the front wall are various small rooms, including the board-room and secretary's office. The workshop portion of the Institute is ranged on the right off a corridor from front to back of the building, with another entrance from "The Green"; the secretary's office, which seems at first sight a little too far from the central entrance, is however perhaps most properly placed where it is, at the angle of junction of the front and side corridors, so as to be of easy access from both portions of the building. The two principal staircases open from the large corridor parallel with Romford-road, towards either end of it, and are well situated for convenience. At the end of this corridor, from Water-lane, a "women's entrance" is provided, and the rooms chiefly devoted to women's work are grouped near this. The main entrance to the large hall is from Water-lane, the hall forming a large oblong apartment running parallel with Romford-road, and filling up most of the centre of the building. The approaches to the room from Water-lane might be improved; there are rather narrow little corners in the corridors outside the two outer doors into the hall, and the ladies' and gentlemen's cloak-rooms should not be planned with doors exactly facing each other, a mistake constantly made in planning; for the sake of symmetry, we presume. The Library block occupies the north-west portion of the site, and is also entered from Water-lane, lower down. It is very well arranged; the reading-room and reference library are kept well inside, away from the noise of the street, and the librarian's room is excellently placed for inspection and control of the whole department. These rooms are for the most part top-lighted. The lending library and book-store are placed towards the outside of the building, thus protecting the rooms for study. In connexion with the large lecture-hall is a wide corridor running from the central entrance in Romford-road into one side of the hall, thus forming a most efficient extra exit without any interference with the main

* We observed that scarcely any of the plans show a north and south point; probably the points of the compass were regarded as known, but it is always better to draw the actual north direction on the plan.

lines of the plan. The retiring-rooms in connexion with the platform are conveniently enough arranged in a mezzanine; they are better at the platform level if it can be managed easily, but it is not essential that they should be so.

The Art-School rooms are on the upper floor, partly on the Water-lane, but mostly on the "Green" front, and thereby naturally get a north light; the class-rooms are grouped on the same floor towards Water-lane, and the chemistry and other technical rooms on the east side. The two small lecture-theatres find place on the Romford-street front, back to back, the door of each being near the head of one of the staircases. The only objection to their arrangement is, that the wall dividing them is built over the centre of the ground-floor vestibule, making rather a discrepancy between the ground-floor and first-floor plans at this point, though it is perhaps one more observable on paper than it would be in fact.

It is rather surprising that nothing is said in the instructions about the aspect of any of the rooms, although, of course, aspect is of the highest importance in the drawing and modelling rooms. This is an oversight; for though competitors ought to know that a north light is required for such rooms, it is evident that some of them do not.

Messrs. Gibson & Russell indicate a system of extract ventilation by means of air-trunks, which are led up to two small towers forming external features in the design, the extract being actuated by an electric fan placed in the upcast shafts.

In the architectural treatment the authors have succeeded in obtaining considerable picturesqueness and originality without incurring disproportionate cost. The Romford-road block has a projecting porch with a curved roof and crouching Caryatide figures (as shown on the detail drawing—they are indicated as standing figures in the general elevation); the lower story is treated with plain rusticated window openings, the upper story with an order, the columns of which, instead of being engaged in the wall surface, are placed standing free in front of the shadow formed by a small recess behind them; between the columns is a range of colonnettes just under the cornice, between which are arranged the windows of the two small lecture-rooms, the middle space being occupied by a sculptured panel at the point where the division-wall between them, as before noted, comes in. The circular-headed gables with an Elizabethan type of ornament in them, at the extremities of the Romford-road front and on the Water-lane front, are a little too *prononcé*, and want refining down. The entrances in Water-lane are picturesquely treated; that to the library has a semicircular porch, which develops into a small circular tower above, which on the upper floor forms part of the art-master's private room, the line of the tower being prettily indicated by two columns introduced in the room, thus appropriately giving a little architectural touch to the room occupied by the art-teacher; a top-light in the inner portion of the room prevents the light being interfered with by this device.

As already implied, we think the exterior design might be improved somewhat in execution, that it wants "pulling together," and refining a little: but even allowing for this, it appears to us to be the best of the exterior designs in the room—at all events of those that could be executed for the proposed expenditure; it has originality and picturesque interest, and is an agreeable variation from the architecture of respectable commonplace which too often characterises the class of buildings called Technical Institutes, and which is seen in many other designs in the room.

The second premiated design, by Messrs. Clark and Hutchinson, is architecturally a much plainer and more commonplace one than the first one, being an almost plain block of building with slight projections in the centre and at the ends, each emphasised by a small roof-turret on the centre line of roof, a slight architectural treatment being given to the central entrance. The design is in good taste, but presents nothing of architectural interest. The plan is exceedingly symmetrical; the lecture-hall is on the centre axis of the plan, at right-angles with Romford-road, and is entered from the centre of this front. The access and cloak-rooms to it are well arranged, and the cloak-rooms are shut off by small lobbies instead of opening direct on to the corridor, which does away with the objection of having their entrances exactly facing each other. There is an area for light on each side of the lecture-hall, and around these and the lecture-hall the Institute portion is grouped in a large parallelogram, the corridors giving a complete circulation all round. The library is quite a separate department at the north-west angle, and the building trades' workshops are separately provided in a one-story block at the north-east angle, with glass roofs. In the main, this is perhaps a better way of treating them, in regard to light, than providing them in ordinary rooms with side-windows. They are connected with the main institute block by a through corridor from front to back. The library block is not very well planned in regard to the uses of the various rooms. The reading-room is placed on the exterior, towards The Green, and the lending-library in the interior, whereas the reverse should be the case, as long as top-light can be got for the inner rooms. The reference-library appears, at first sight, to be well placed in an inner position, but it may be observed that it is only separated by an open space of 25 ft. from the engineering workshops, from which it seems probable that disturbing noises would be heard. The librarian's room is not so well placed for general inspection as in the first plan. The main staircases in the Institute block are almost exactly where they are placed in the first design, and the lavatories behind them. On the upper floor the art section is placed along the Romford-road side, but with the intimation "north top light." In the case of the "advanced drawing-room" this light would be somewhat interfered with by the upper portion of the large lecture hall, which is very near to it. The small lecture theatres are placed symmetrically at the north-west and north-east angles of the upper floor; the access to them is rather far from the main stairs, and the doors not very well placed for convenient ingress and egress, but as they are not for a large number of persons this is not a serious drawback. The side-entrances in the main front are labelled for men and women respectively, and are each contiguous to the departments which would be most frequented by the sex for which they are set apart. There is a good deal of merit in the general orderly and simple disposition of this plan, and its place in the award is quite justified.

In the third premiated design, by Mr. T. Davison, a much less portion of the ground is built over, in consequence of the use of an extra story, which, however, is not nearly so good an arrangement. The lecture-hall here is placed at the Green and Water-lane angle (north-west angle), but with a corridor of access also from the central entrance in Romford-road, and with cloak-rooms, &c., to each entrance; a wasteful arrangement. The Library department, on the east side of the building, is well arranged, and the reading-rooms are secured from noise. The Building Trade workshops of the Institute department are all in the basement, approached by a cart-road from the Green; some of those which are lighted from the inner courts would certainly be deficient in light. The class-rooms are all on the first floor, towards Romford-road, and the Art School on the second floor over these. The access to these rooms, through the museum, which forms a kind of large lobby at the head of the central staircase, is rather crudely arranged; and we find in the upper floors long rooms with windows at the end, &c. Generally speaking the plan wants simplicity. In the design, the treatment of the end wings, with rather heavy circular angle-turrets, does not harmonise with the centre; there is a want of coherence about it.

It is said that a great many well-known architects in the junior ranks of the profession are engaged in this competition. If so, a general review of the designs suggests the conclusion that planning is the department of architecture least studied among the rising race of architects. There are few of the plans which show any sense of the necessity for properly grouping the rooms in a large building, and many of them seem to have been designed without any realisation on the part of the authors of what the actual working of the plan would be, or of the special requirements of special departments. A considerable number of the competitors appear to think that the best thing to do with a reading-room or a reference library, where quiet and freedom from disturbance are especially necessary, is to place it against the outside wall at the noisiest angle of the building, where the two principal streets meet. There are designs which are well and suitably treated in the elevations, and appear in this respect to be the work of a practised hand, as in No. 6 for instance, where a mere glance at the plan shows that the scheme is perfectly futile. No. 16, one of the most elaborate designs, shows the reading-room at the noisy exterior angle, and the space for the public in the lending library provided by a long passage at right-angles to the entrance and penetrating into the intestines of the building. The very first point to be aimed at in a lending-library is that the access to the lending-counter should be as direct and simple as possible; that it should immediately face the entrance provided for it, so that people can go straight in and out without jostling. In some of the plans the provision seems to be studiously the opposite of this. No. 20, with a very coarsely-treated elevation, has merit in the plan, which is very symmetrically laid out, and the access to the smaller lecture-rooms better provided for than in most others. No. 21 shows a very pleasing elevation, but the plan is hopeless. No. 33 is an effective design, and is superior to many in plan, but the plan wants principle of arrangement; look at the door to men's lavatory for instance, close to and nearly opposite the door of the board-room. Such *contretemps* in planning are not in accordance with the fitness of things. No. 40 has good points in the plan, which however is too scattered, and the irregular treatment of the vestibule to the lecture-hall is very clumsy; the perspective view is an effective sketch, showing character and originality. No. 42 shows a good deal of attention to classification in planning, with the serious defect that the large lecture-hall, which, as we have said, is one of the key-points of the plan, is merely got at by side doors out of an ordinary corridor. In such a plan there ought to be no doubt whatever where to turn for the principal room, and its entrance ought to be in a direct line from the street. The perspective of this design shows good taste and some originality of treatment, and the lending-library approach is properly planned; but the one central staircase leaves a very lengthy journey to some of the upper rooms of the technical department.

No. 47 looks at first sight a compact plan, but the reference-library is badly placed, and it is a piece of touching simplicity to put an "emergency exit door" from a corridor adjoining the large hall, when there is no extra door out of the hall itself. No. 49 shows cleverness in some points of its planning, but it is so arranged that every room in the building has either a west or a south aspect. In No. 59, which is very square and symmetrical in arrangement, the lecture-hall and one of the small theatres forming a kind of island in the middle between two corridors running from front to back, the author's passion for symmetry has induced him to put the lady performers' room open-

ing out of one corridor, and the gentlemen's out of the other on the other side of the hall, with no common access, so that if a performer or lecturer who does not know the building gets to the wrong door, and sees "ladies' room" on it, he cannot rectify his mistake without going all round the block to the other corridor. That is what comes of not thinking how a plan will actually work in operation. The approaches and cloak-rooms for the public, to the large hall, are badly planned also. No. 61 affords an amusing instance of lack of principle in plan. It is very symmetrical in arrangement, and the centre, opposite the principal entrance, is occupied by one of the two smaller lecture-rooms, labelled "chemistry lecture-room." It never seems to have occurred to the author to consider why the chemistry lecture-room should be placed as if it were the central *raison d'être* of the whole building. The access to the lending-library is well arranged, and the reference-library well placed. The entrance to the large hall in the middle of one side is a very bad way of entering such a room. As a specimen of the entire want of perception of the working of a building, we may observe that in No. 62, a most elaborately got up set of drawings, the library department, which was particularly specified in the instructions to be arranged so as to be all within easy supervision of the librarian, is actually cut in two by the large central entrance-hall and staircase, so that the various rooms are completely separated from each other.

The two reflections which remain with us, after a review of the drawings, are, first, that the West Ham authorities are much to be congratulated on having set an example of a competition conducted with absolute fairness from beginning to end, and on having secured the best design for their purpose; and, second, that the study of planning must be a good deal neglected among architects at present. The "Brown Book" of the Architectural Association shows a list of lectures on many subjects, but none on planning. We should suggest that they should specially take up this subject in a future year.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND.

By Professor Baldwin Brown.

I.—*The Surviving Evidence.*

AMONG our national monuments in the form of the great cathedral and abbey churches recently illustrated in the *Builder*, no one is of a date prior to the Norman Conquest. Below ground at Peterborough, and possibly at York and Winchester, and above ground at Christ Church, Oxford, there are relics, in the first case of considerable extent, of pre-Norman buildings; at Stow, in Lincolnshire, there are still standing the transepts of a Saxon church that is thought by some to have once held cathedral rank; but, with these exceptions, the more important ecclesiastical structures of the Old English period have completely disappeared.

Yet these structures were in their day both numerous and imposing. As early as the end of the seventh century Wilfrid erected a church at Hexham that was said at the time not to have its like this side of the Alps, and that even in the twelfth century excited the admiration of the contemporaries of William of Malmesbury. The Saxon Bishops had their cathedral churches, but these, often located in obscure places, were, as a rule, comparatively unpretending. The dimensions of Stow do not exceed those of a large village church of to-day. In those cases, however, where the cathedral was also an abbey church it generally possessed architectural grandeur. The cathedral-abbeys and the other Benedictine houses of the first rank, belonged to wealthy and pushing communities, and such monastic churches as those of Winchester, Peterborough, St. Augustine's and Christ Church, Canterbury, St. Albans, Glastonbury, or Gloucester, would have exhibited the best architecture of which the time and country were capable. It is true that the country had suffered greatly through the ruin of its monuments during the Danish wars, but this had been largely made up by an immense activity in building in the tenth century, in that era of monastic revival embodied for us in the ecclesiastical statesmen and artists, Dunstan and Ethelwald. If Sweyn had laid the country waste in the course of the last and most effectual Danish inroad, his son and successor was equally energetic in the work of restoration. At the time, therefore, of the Norman Conquest, the chief ecclesiastical sites were supplied with buildings corresponding to the demands of the age. Each structure of stone (for of wooden buildings there is for the moment no question) would probably have shown portions dating from the first age of the Saxon Church, before the Danish wars, while more would belong to the time of revival under Dunstan, and to the epoch of church-building which opened with the conversion of Canute. The fact that in every case these Saxon edifices have yielded place to later structures may be taken to show that, though sufficient in their time, they were not up to the later Mediæval standard in size, solidity, or architectural character. It may be interesting to ask the question when, and under what circumstances, did this substitution take place?

It is worthy of note that, of the important Saxon churches, the one which lasted longest into the Mediæval period was among the earliest of all. In the case of the monastery at Hexham, the researches of Mr. C. C. Hodges make it clear that Wilfrid's edifice was still serving as the nave of the extended abbey church up to the devastation wrought by the Scots in 1296. None of the others survived so long, but we need not assume that the Normans condemned them at once as intrinsically worthless. In the case of five of the most important cathedrals and abbeys, Canterbury, York, London, Gloucester, and Peterborough, and in that of Hereford also, the Saxon buildings were ruined by fire within a few years of the Conquest, and had necessarily to be rebuilt; while Rochester, Wells, and St. Frideswide's, Oxford, were in a greatly dilapidated condition. At St. Albans, at the end of the tenth century, a Saxon abbot set on foot, though he did not carry out, a grand scheme of re-building, which points to the fact that the actual structure was recognised as small or faulty. At the important sites of Winchester, Ely, Durham, Worcester, Exeter, the re-building seems to have been deliberate. Worcester was re-constructed by its Saxon Abbot Wulfstan, who pulled down the structures of his predecessor, Oswald, because they were not large enough, though he shed tears at an act which seemed to him to savour of sacrilege. At Exeter, the first Norman bishop was thought to show a certain want of spirit and ambition, in that he was content with the ancient buildings of the abbey founded by Athelstane and restored after the Danish wars by Canute. An ancient seal attached to some charters in the possession of the Exeter Dean and Chapter appears to give a representation of the façade of this edifice (Fig. 1). We may surmise that the round tower at the south is a relic of the work of Athelstane, while Canute's builders would be responsible for the remainder. Such as it was, however, the second Norman bishop, Warelwast, was not satisfied with it, and commenced in 1112 a new pile of which the well-known transept towers are surviving portions. At Winchester and at Ely the Normans found on the sites buildings dating in all essentials from the great era of Church restoration in the latter part of the 10th century. Such buildings might have stood for hundreds of years, but they were completely removed and new edifices constructed from the foundations by the first Norman bishop and abbot.

To understand aright this procedure of the Normans we must remember that the age, as a whole, was one of extraordinary architectural activity. It was the ambition of each generation of builders to surpass all that had been done before, and the Normans of the second period treated the earlier efforts of their countrymen with the same scant courtesy that was shown at the Conquest to the Saxon edifices. It is a

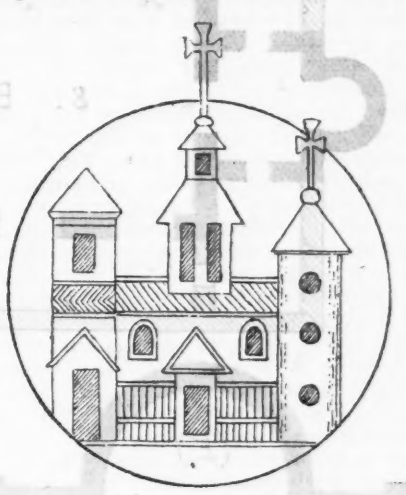


Fig. 1.—Exeter: From an old Seal.

striking fact that though Archbishop Lanfranc had erected from the foundations at Canterbury a new Metropolitan church that must, at least, have equalled the great abbeys at Caen, yet, within a generation, the Priors Ernulph and Conrad pulled down his choir and re-erected it on a scale of transcendently greater magnificence. The Norman abbey church at Peterborough is more than double the size of the Saxon structure burnt down in 1116, the plan of which, as shown in Fig. 2, has partially

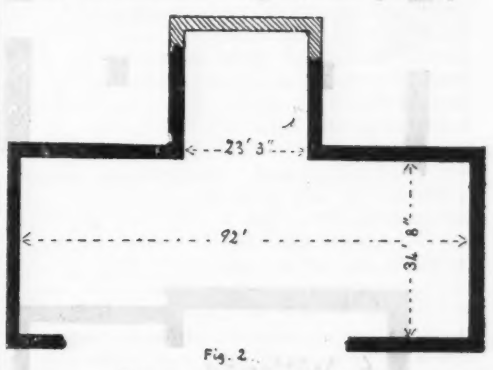
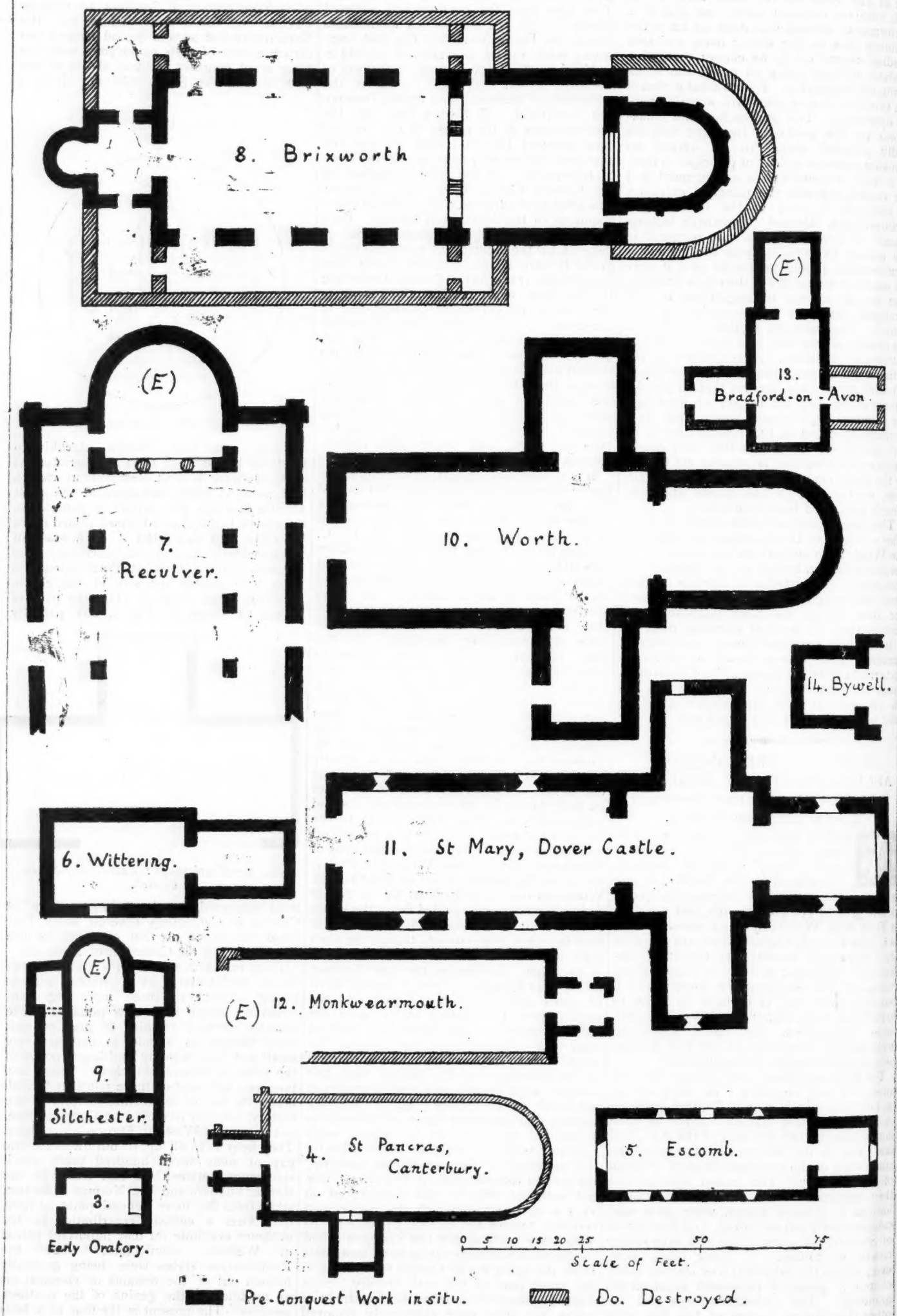


Fig. 2

Fig. 2.—Peterborough: East End of Saxon Church.

been recovered, but the "glorious choir" of Conrad at Canterbury covered about four times the space of that occupied by the eastern part of the Cathedral of Lanfranc.

It is impossible to form a right idea of Saxon architecture as a whole, without taking account of these more important structures which have now perished. The actually existing remains of pre-Conquest work belong, as a rule, to comparatively small and unpretending buildings, mostly in the form of village churches. There are, however, sufficient of these relics to furnish materials for an interesting chapter in the history, not only of our national architecture, but of that of Western Europe as a whole. They help us to fill up, in our own case, the gap of some seven hundred years which intervenes between the last works of the Roman builders and the Norman Conquest, while from the more general point of view, they form a curious contribution to the evidence available for that important period of Western architecture, when the Romanesque styles were being gradually formed out of the remains of classical art as modified by the genius of the northern peoples. The present is the first of a brief series of papers designed to deal with some of the outstanding topics of interest connected with pre-Conquest architecture, especially as it is exemplified in existing monuments.



Figs. 3 to 14.—Comparative Plans of Pre Conquest Churches.

It will conduce to clearness if we start with a cursory glance at the chief varieties in the plans of Saxon churches, so far as they are known to us. The series of plans shown on the adjoining page, all drawn to one scale, gives a characteristic selection both of the smaller and the more important structures. To begin with the simplest possible form, that of the oblong, single-celled oratory, without any distinct sanctuary, of the plan shown in fig. 3, we may find this type preserved in more than one outlying region of the country, and it will be sufficient to mention two small buildings of the kind that have left their traces on what is known as St. Cuthbert's Isle, a rocky point—island or promontory according to the tide—on the shore of Lindisfarne. It is not necessary to believe that the foundations there seen are as old as Cuthbert's day, but they may possibly be so, and they doubtless perpetuate for us the type of structure reared on countless sites by the early Christian Hermits or missionaries in the remoter districts that they were winning for the Gospel.

The next type is that in which the general form of the oblong cell is preserved, but a special altar-house or sanctuary is provided in the form of a second chamber cut off from, or opening out of, the first. This sanctuary may take one of two forms. It may either be an apse or be terminated apsidally, or it may be rectangular like the main building. One interesting example of a single cell ending in an apse exists in part at St. Pancras, Canterbury, of which the plan is given in fig. 4. The structure is built of Roman brick, and may be pronounced on technical grounds to have the best claim to be considered Roman or Romano-British of any ecclesiastical relic in the country, save only the supposed early Christian church at Silchester. The single cell with an adjunct in the form of a square-ended sanctuary is a common type, and appears to have been the normal form of the smaller Saxon churches. A simple example is shown in fig. 5, which gives the plan of the interesting early church at Escomb, county Durham. In somewhat different proportions the same plan meets us at Wittering, in Northants (fig. 6), Boarhunt, Hampshire, Arlington, Sussex, and elsewhere. Most of the churches of the kind have, however, like the well-known Corhampton, in Hampshire, lost their original eastern terminations. The majority of the Saxon ecclesiastical structures that have come down to us are aisleless, but the larger cathedral and abbey churches had probably side aisles.

The same difference is observable in the latter as in the smaller buildings. Some had apsidal, others square-ended, sanctuaries. The abbey church at Peterborough (fig. 2) ended square, for Mr. J. T. Irvine reports that this is certain, although the actual east wall has not been uncovered. The presence of Saxon graves immediately to the east of the structures shows that there was no space for a projecting apse. The church at Repton, in Derbyshire, famous for its possession of a Saxon crypt, which was cruciform and perhaps possessed side aisles, still displays its square ended Saxon chancel. On the other hand, there are three completely basilican churches known, two pillar basilicas, at Reculver, in Kent (fig. 7), and Brixworth, Northants (fig. 8), and one apparently columnar basilica on a very small scale, at Silchester (fig. 9). These basilicas are naturally apsidal. That of Brixworth has marked peculiarities which will be noticed in their place. An ambulatory surrounded the apse, and this suggests the presence of a *confessio* or crypt beneath it, after a familiar Early Christian pattern. No such *confessio* has, however, been found.

A more advanced type of plan brings into view transepts, and even a fully developed cruciform scheme. Embryo transepts of an Early Christian form may be discerned at Silchester, and complete ones occur in connexion both with a square-ended and an apsidal presbytery. Of the latter, the best example is Worth, in Sussex (fig. 10). The former occurs at St. Mary's, Dover Castle, and Repton, in Derbyshire; other cruciform churches are Stow, Lincolnshire; Norton, County Durham; and Stanton Lacy, Shropshire. St. Mary's, Dover Castle (fig. 11), is the only example that is perfect, the rest are in part more modern. At Dover and at Norton there is a well-preserved Saxon square tower over the crossing.

The western end of the Saxon churches was sometimes occupied by a porch, but more often by a square western tower. At Silchester there is found at the entrance end a wide narthex of the Early Christian pattern, while in other examples, as at Monkwearmouth (fig. 12) and St. Pancras, Canterbury, there are narrow western porches of a form peculiar to the Early Christian architecture of our own country. North and south porches are found at Bradford-on-Avon, Wilts (fig. 13). The square western tower, almost as broad as the church, occurs in very many instances, of which St. Andrew's, Bywell, on the Tyne (fig. 14) may be taken as typical. Finally, some of the greater churches had two western towers, or one western tower and a tower over the crossing. Our only evidence for these is literary, except in the case of Exeter, where, as we have seen (fig. 1), an old seal seems to give a view of the Saxon abbey church which stood till a few years after the Conquest.

NOTES.

THE verdict of the jury in the case of the Morecambe Pier disaster throws a significant light on the happy-go-lucky methods of Local Authorities in connexion with the building and supervision of structures of the kind in question. From the report furnished by the Board of Trade Inspector, it would appear that the authorities had made additions to the Morecambe Pier without submitting plans in the usual way to the Board of Trade, whose sanction for the new work had not, therefore, been obtained. The additions included the landing-stage which has collapsed with such disastrous results. The evidence proved that this portion of the pier, which was built in 1872, had been in a most unsafe condition for several years, a fact which could easily have been ascertained if the pier directors had taken the trouble to discharge their obvious duty. The bolts which secured the girder to the grating had been eaten away by corrosion. A little extra pressure was all that was necessary to bring about the catastrophe by which three people lost their lives, and many suffered from shock and, more or less, serious bodily injuries. Under the circumstances, we cannot be surprised that the jury should have censured the pier directors for having neglected to take steps to satisfy themselves that the structure was in a safe condition. The lesson was needed, and it is to be hoped that at other seaside places round our coast, those who are responsible for the stability of piers and landing-stages will take it to heart. In calling upon the Board of Trade to institute a periodical inspection of such structures, the jury revealed a perfect acquaintance with the real needs of the situation.

THE use of a higher pressure on the consumer's wires has long been contemplated by electrical engineers, as great economy in the weight of copper used in the mains would result. For example, if the pressure at which electricity was supplied were doubled, then twice as many consumers could be served without increasing the size of the mains. The drawback hitherto has been the want of really good lamps for high voltages. The Edison-Swan Company makes practicable lamps that can be used on a 220 or a 230 volt circuit, but does not guarantee them; some of them have failed after a very short life indeed. Notwithstanding this, the Corporation of Bradford decided some months ago on this method of doubling the capacity of their mains, and within the last few weeks, the Vestry of St. Pancras have been quietly introducing this innovation. The pressure of the Bradford supply was originally fixed by their consulting engineer at 115 volts as being the highest pressure at which good lamps were available, and a simple two-wire system of distribution was adopted. It was subsequently altered into a three-wire system in order to meet the great demand, the pressure between the outer mains and the inner one being still kept at 115 volts, and the pressure between the two outer ones being 230 volts. The demand still increasing, and the mains threatening to become overloaded, the Corporation decided to supply all new customers at 230 volts, simply connecting them on to the two outer mains, their old customers being still served as before. This action of the Bradford Corporation was a great inducement to lamp-makers to attempt to make a good high voltage lamp. It is too soon yet to say whether any of them have succeeded, as a long time is needed to thoroughly test a lamp. Mr. Sydney Baynes, the Electrical Engineer to the St. Pancras Vestry, in a letter to the *Times*, says that he has had some 220-volt lamps in constant use for eighteen months with excellent results, and he has consequently initiated a movement to supply the Vestry's customers at 220 volts, instead of 110 volts as formerly. Strange to say, this movement is looked on unfavourably by many suppliers of electrical accessories, amongst others, who contend that until lengthened trials of 220-volt fittings have been made, there will always be liability to sudden extinction of the light, if not grave risk of fire. They also complain that a 16 candle-power lamp is the lowest candle-power high voltage lamp that can be got. Mr. Baynes meets their objections by saying that ordinary first-class fittings, combined with good workmanship, have long proved thoroughly efficient and safe in carrying even a higher voltage than that to be introduced at St. Pancras. He also mentions that 8 candle-power lamps at 230 volts are in the market, and that Mr. Stearn, the joint inventor with Mr. Swan of the incandescent lamp, has produced a high voltage lamp of 6 candle-power. He wisely refrains from making any comments on the efficiency of these small candle-power high voltage lamps. Of course, 220 volts is not a dangerous pressure to have in a house—a smart tingling is felt when touching two wires between which there is this pressure; but unless one be very susceptible to shock, or have very damp hands, it is not even unpleasant.

FROM the monthly report of Mr. Sylvanus Trevail, Chairman of the Sanitary Committee of the Cornwall County Council, it appears that much complaint has been made lately of bad smells at Truro owing to defective drainage, especially by passengers landing at the quay from steamers. There have been similar complaints all along the course of the River Kenwyn, in which sewage matter has been allowed to stagnate, and also complaints from similar causes at Helston. That in regard to Truro is of course the most serious, as it affects the greater number of persons, and it is a very serious matter for a town that visitors coming to it by water should be greeted with bad and unwholesome smells as their very first introduction to the place. It is to be hoped that the Cornwall County Council will at once bestir themselves to ascertain the causes of this evil, and abolish it.

FOR a further extension of the Borough Market some houses are being demolished on the east side of Stoney-street, Southwark. The workmen have brought to light a large piece of massive old wall of flint, chalk, and brick, having on its north

Chair-back with Coat of Arms in Cut and Tooled Leather.—Designed and Executed by Mr. H. Jacobsen.

face a filled-in four-centred arch, its voussoirs of red brick and with arched cellars beneath. In view of their position these are considered to be remains of Winchester House. On May 24, 1884, we published Mr. C N. McIntyre North's drawings, with details and key-plan, of a square-headed window having two mullions, and a depressed four-centred arch (both filled in), of the bishop's house, as sketched by him before their destruction three years previously. Those fragments were discovered in pulling down to the ground level about 75 ft. westwards of the old walling on either side of Stoney-street, running parallel at a distance of 36 ft. with Clink-street. The bishop's house stood next west of St. Saviour's Dock, one of the most ancient "harbours" on Thames side. In Robert Wilkinson's plan of 1811, "Winchester House" and "Winchester-yard" are plotted between Stoney-lane (west), and the Dock and Church-street (east). A corresponding plan of 1827 seems to show that the east gable-end of the Gothic Hall abutted on the dock-side. The walls of the hall and its beautiful round window in that gable were again laid open by the fire of August, 1814.* The old buildings had been sold, in 1647, to one Thomas Walker, of Camberwell, for nearly 4,400*l.*, and were soon afterwards converted for commercial purposes. At the angle of the Dock and Clink-street, where are now Stave Wharf and Primrose-alley, were erected some water-works, which were finally cleared away twelve years ago. Winchester House was founded *circa* 1107 by Bishop Gifford, to whom is attributed the earlier nave of St. Saviour's Church; he was there succeeded by Henry of Blois. The last prelate of that see who lived there was Lancelot Andrewes, *obiit* 1626, whose tomb and monument, with effigy, are in St. Saviour's. In 1663 Bishop Morley obtained an Act for leasing the buildings and site, and for removal to Winchester House, Chelsea—familiar to readers of the Diary and Letters of Madame D'Arblay. Next south was the Bishops of Rochester's town-house, taken down in or about 1604; the estate, once known as Grime's Croft, and now occupied in part by the Borough Market, was given to the monks of Rochester by William, second Earl Warren; adjoining thereto was the "inn" of the Abbots of Waverley. In a "Note" on January 1, 1892, we gave a brief history of the Market, for an enlargement of which Mr. McIntyre North had prepared plans for the trustees. We may add that in Stoney-street, which marks the course of the ancient causeway to the passage across the Thames, nearly opposite Dowgate, was the house, Fastolfe-place, of Sir John Fastolfe, who carried on his Yarmouth trade at Pickle Herring Wharf, close by.

* See also the views in "Londina Illustrata," and the *Gentleman's Magazine*, December, 1814; and the water-colour drawing, 1810, in the Soane Museum.

THE design in leather of which an illustration is given on this page is an example of the work done by Mr. H. Jacobsen in hand-cut and tooled leather. In this work the artist's design has to be done on transfer-paper, which is pinned on to the leather, and the outlines of the design are gone over with a tracing tool, which indents the design on to the leather without cutting it. The outlines are then cut half through the leather, and the space between the ornaments pressed down, so as to bring the ornament into relief, and the leather is undercut in that part of the ornament which it is desired to render most prominent. The hollows at the back, where the relief has been produced, are filled up with modelling wax, to render the back surface even. The background of the design is then punched by "star" and "ring" punches to give it a special texture and surface, so as to throw up the design, as seen in our illustration. The final process is the staining or tanning of the leather, after which, the design having lost some of its sharpness in the process, it has to be gone over with finishing touches with the modelling-iron, and is then ready for mounting. The art of treating leather in this manner is one which it is very desirable to see revived, and is capable of producing excellent decorative effect of a permanent character. For those who may wish to try this method of work for themselves, Mr. Jacobsen has produced a descriptive guide as to the details of the process,* with illustrations of the kind of work that may be produced. We do not admire the style of all the designs in the book, many of which are not sufficiently conventional; but the illustration we give (which is superior to those in the book) shows that a good style of decorative work can be produced by this process.

* To be obtained from the author, 101, Great Portland-street.

THE system of insulting members of the architectural profession by offering them bribes to make use of special goods has perhaps seldom been attempted in so barefaced a manner as by a person who calls himself "Artistic Furniture Maker," and who has sent round to the architectural profession a printed circular to the following effect:—

DEAR SIR,—In order to meet the requirements of a few of my friends in your line of business, I have now the pleasure to inform you that I am prepared to offer exceptionally good terms in respect to introductions you may be able to send me for supplying my artistic furniture to your clients. As my business is *strictly a wholesale one*, it will be necessary to execute all orders through you, and not direct to your clients, and upon all goods purchased through your instrumentality, I would quote prices to allow of an agreed-upon profit to yourself."

On Thursday morning we received copies of this circular from no less than six different architects, accompanied naturally by expressions of the greatest indigna-

tion; another copy of it was sent to the Editor of this journal at his private address. Earlier in the same week two architects sent us copies of a circular received from an ironmonger's firm, whom we will call "W——— & Co., commencing with the words "We observe that you have several contracts in hand just now. . . . We do a large trade with architects, and many of them schedule our goods, and we allow them a good commission." The document proceeds:—

"If you think anything can be done, we shall be pleased to send a large list subject to 20 per cent., from which you could find almost anything requisite in the trade, or if you could give us an introduction to your builders, we would allow a commission on orders resulting. Kindly think matter over, and let us hear from you in course."

If it is true that "many architects" schedule the goods of this firm and receive large commissions from them, it perhaps can hardly be surprising that tradesmen who know nothing of professional practice and professional honour and integrity should imagine that one architect is the same as another, and that inducements which have been accepted by some could be offered to others; and possibly Messrs. W——— & Co. may really believe that what they are doing is only in the ordinary course of business. It will, perhaps, put the matter in a new light to them if we explain that any architect who was known by the Council of the Institute of Architects to have accepted commissions of the kind they offer would, if a member of the Institute, be liable to expulsion from its ranks, and that in sending such proposals to men of any standing in the profession they are doing the very worst thing for their own interests.

A DAY'S WALK IN SOUTH BUCKINGHAMSHIRE.

ON June 25, 1643, the day after he died at Thame, they buried John Hampden in the church which stands within the shadow of his ancestral home. As he was born in London in 1594 (Wood's *Athenæ Oxon.*, edit. Bliss) it seemed we might appropriately devote a day to walking through the country—unsurpassed for verdant beauty of woodland, hill, and valley—of Hampden and Milton, the Fleetwoods, Waller and Burke.

Starting, then, from the sixteenth-century "Treaty House," at Uxbridge, where Charles I.'s Commissioners met the Parliament men in 1645, latterly a home of the Bennets, and now the "Crown" inn, we enter the county on crossing the Colne, and see before us the high road, which, traversing Gryme's Dyke on the remoter side of Great Missenden, and the Ickneild Way at Wendover (for which Hampden and Burke sat in Parliament) winds through the Chiltern Hills to Aylesbury, and so along Akeman-street into Oxfordshire. We first reach Denham, one of the prettiest villages roundabout, its meadows and groves watered by the Colne, and the Mease or Misbourne, the latter running down a valley, in which lie Great and Little Missenden, Amersham, and the two Chalfonts. The church, mainly Perpendicular, with a Norman tower, has been carefully restored. It contains several memorials of the Peckhams and Bowyers, and a brass (1545) to Agnes Jordan, last Prioress of Syon. In 1715 there were found in the church some singular monumental devices, consisting of fluted vases bearing flowers of horn and silk, with leaden leaves. At Denham Court Lady Bowyer concealed Charles II. when a fugitive. Denham Place, a large plain house, locally famed for the number of its windows, was built in 1667 by Sir Roger Hill, of the prevalent red brick. Next beyond is Fulmer, in a vale; its church rebuilt, for the most part, in the Perpendicular style, by Sir Marmaduke Dayrell, in 1610, but since enlarged with a new chancel, vestry, and south aisle, by and in memory of Mrs. Dent, of Fernacres, in this parish. Some of the graves are dug nearly north and south. Within the parish is the greater portion of Bulstrode Park, an ancient estate and containing some earthworks. Lord Chancellor Jeffreys bought Bulstrode from Sir Roger Hill, in 1686, and built a house there. His son-in-law, Charles Dyve, sold the property to William Bentinck, first Earl of Portland, who retired thither on William III.'s death. That house, which Mrs. Montagu's letters and last century's political life should render famous, with gardens laid out by Repton, was rebuilt *circa* 1865, by the Duke of Somerset, of Bath stone and deep-toned brick, after what is termed the old English manorial fashion. A left-hand road takes us up to the wide expanse of Stoke Poges Common, brilliant with flowering heather, which separates us from West End where lived Gray. The middle road leads to Gerrard's Cross and Beaconsfield (more correctly Beckonsfield), whose former rectory-house served for a while as a subpriory to the Benedictine convent founded 1265 at Burnham by Richard, brother of Henry III., and King of the Romans. Finished in 1543, by Rawson, Canon of Windsor, it is perhaps the oldest parsonage in England. In an introduction to his account of Eltham Palace (1828), J. C. Buckler writes:—

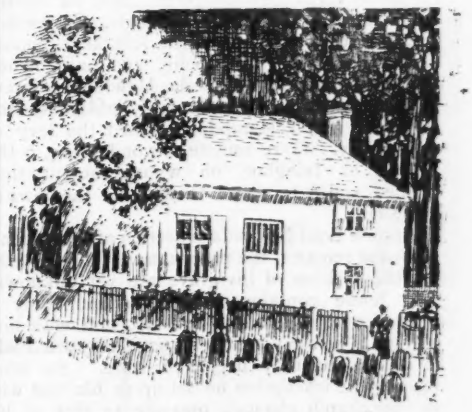
"Its basement story is built entirely of brick, glazed with chequered patterns; and its upper story with lofty gables and roofs, is formed of strong timbers closely placed and plastered between. The house encloses three sides of a quadrangle, the fourth having a high wall and the gateway. The principal staircase is attached to the north-side; it is semi-cylindrical, and composed of timber, and though perfectly plain is a curious feature of the building. . . . . Here are horse-loads of solid timber in dark passages, of great lengths and little use. . . . . The floors were formed of enormous planks, and the steps to them of massy blocks, on which the axe almost labours in vain."

Burke, with his son and brother, and Waller, lie in the churchyard; the last-named in a well-known tomb bearing an epitaph by Rymer, of the Fœdera. A first cousin of Hampden, he was born at Stock Place, in Coleshill, a detached part of Hertfordshire, near Amersham, but succeeded to his family's seat, Hall Barn, in this parish, which was afterwards enlarged by Colin Campbell, and is illustrated by Hulsberg in the "Vitruvius Britannicus." In 1832, Sir Gore Ouseley, Bart., Ambassador to Persia, bought the property from H. Edmund Waller. Burke purchased Gregories, since Butler's Court, from the Wallers in 1769. It is at his country home that we like best to think of Burke, observes his latest biographer; there he was happier than elsewhere, and happiest there when the house was full of guests. There he received Johnson, Garrick, Reynolds, Macintosh, and Fox, and gave shelter to Crabbe and the two Brahmins, for he was as charitable as Goldsmith. His widow sold the house, which was burnt down shortly after her death in 1812; the stables remain, and some grass-grown mounds near the road to Penn mark its site. Beaconsfield, with its wide street of low, white houses shaded by trees, has, like Amersham and Wendover, lost but little of its old-world aspect.* On Fulmer Common stands the Reid Memorial Church, designed by Sir William Tite in the Byzantine style—see the *Builder*, vol. xvii., 588, 616.

The main road leads on northwards to Chalfont St. Peter, bounding on the right the finely-timbered Chalfont Park (the house designed by Chute for General Churchill), through which runs the Misbourne. Here we enter the Chalfont valley, a high range on the east dividing us from the valley of the Colne. Beyond the Park, on the right, is the Grange, memorable as the home of the Quaker Peningtons, whence Isaac Penington was taken to Aylesbury Gaol. Isaac married Lady Springett, whose daughter, Gulielma, married William Penn in 1672. St. Peter's was erected *temp.* George I.; it has an embattled west tower with turret, and a later east end in the Early Pointed style—all being of red brick; at the corners are some squared stones from Verulam. A road by the church leads west-

Milton's Cottage, Chalfont St. Giles.

wards to Layter's Green, and to Jordans (see our "Note," Sept. 15, 1894). Abraham Newland, for thirty-two years chief cashier to the Bank of England, had a house in this parish. On reaching a bye-road to West Hyde and Harefield (also associated with Milton and his "Arcades") we turn from the high road into the valley, and walk through the riverside meadows to Chalfont St. Giles. At the restorations here by Street, Mr. Seddon, and Mr. J. Oldrid Scott,* the square bases of two Norman pillars, and of the chancel arch-piers, were preserved. A beautiful double piscina with a middle shaft, and a lancet window, denote the early English period of the chancel, but its east window is about one hundred years later, *circa* 1320, and as restored by Street, its central and two sub-arcuated side-lights present a highly interesting example of a blending of perpendicular and flowing decorated forms, as do also the two-light side-windows of the north aisle. On each side of the chancel-arch is an unusually large hagioscope. Many of the fourteenth-century frescoes remain; one is believed to depict a donation of rectory and advowson by Bradwell Priory to the See of Lincoln, which included this county until 1845; a figure dancing before a banquet-table, resting prone on her hands, is perhaps Herodias' daughter. There are some Gardyner brasses, with one to Thomas Fleetwood (and his numerous family), of the Vache, great-grandfather of Cromwell's son-in-law, and ancestor of Colonel George Fleetwood, regicide, who forfeited that property on attainder. The carved-oak altar-rail was given by Francis Hare, Marlborough's chaplain at Ramilies and Blenheim, Bishop of Chichester and Dean of St. Paul's, and, it is believed, comes from the latter cathedral. Beneath a house in the village street is an old lych-gate, like those at Heston and Hayes (Middlesex), turning on a stout central spindle, and retaining its two pulley-wheels. We rejoin the high road at the "Pheasant" inn, whence a bye-road skirting the Vache beech-woods leads northwards to Cheniest and Latimer, whither Charles I. was taken after the battle of Holdenby, it being then in dower to Elizabeth, Countess of Devonshire. At Latimer was found a Roman villa. Within short distances are the Vache, an ivy-grown house, whereof some parts date from the fourteenth century; Bottrells, where lived Thomas Ellwood; and the Grove, a seat of the Gardyners. Sutton, founder of Charterhouse, married Elizabeth, widow of John Dudley, of Stoke Newington, and daughter of John Gardyner, of the Grove, which latterly served as a Quakers' "Meeting-house" until the erection of that at Jordans.



Quakers' Meeting House, at Jordans.

The main route takes us to Amersham, or Hagmondesham, represented by Waller in Parliament, one of the many possessions given by

* In the King's Library, British Museum, are several views of Bulstrode (one by H. Repton), Gregories, the old rectory, and Burnham Abbey.

* See the *Builder* "Note" cited in text. Street was architect to Oxford diocese. Of parish churches in this county, he restored Aston Abbotts, Bradenham, Cheddington, Dinton, Hardwick, Hulcott, Ilmire, Lillingstone Dayrell, Soulbury, Wendover, and High Wycombe; he also designed St. Peter's, at Chalvey, near Slough; St. Ann's Chapel-of-Ease, at Wycombe Marsh; St. James and the schools, New Bradwell; All Saints', Nash; St. Mary's, Westcott, near Waddesdon; and the memorial screen, Eton Chapel. Sir G. G. Scott, who was born at Gawcott vicarage, Buckingham, restored the parish churches (in this county) of St. Mary's, Aylesbury; SS. Peter and Paul, Buckingham (continued by his son); and St. John's School, Buckingham, Chesham, Grandborough, Hillesden, Latimer (an enlargement of Blore's church, built 1841), Olney, Padbury, Shalstone (rebuilt 1828), and Wing (Saxon arcades, crypt, and polygonal apse). He also designed St. Mary's, Wolverton End, Stony Stratford, and Weston Turville Rectory-house. St. Mary's, Slough, erected in 1837, has been enlarged by Mr. J. Oldrid Scott, who also has restored the church at Horton, where Milton's mother and first wife are buried. This list does not profess to be complete.

† See the *Builder*, June 10, 1893—"A.A. Summer Visits." The almshouses, founded 1603, by the Lady Anne Russell (Countess of Warwick), were pulled down three or four years ago.

William I. to Geoffrey de Mandeville, and owned by the Earl of Warwick *temp.* Edward IV. In James I.'s reign the daughter of William Tothill, of Shardeloes, brought it in marriage to the Drakes, whose chapel in the church has monuments by Scheemakers and Bacon. On the outskirts of the town—the lines of its houses broken by many a white gable and projecting front—is Little Shardeloes, which some consider to be the old manor house. We now emerge into the Chiltern Hills, whose chalk rock, once quite covered with forests of beech, rises to a height of 900 ft. at Wendover. We turn aside into Shardeloes Park, seat of the Tyrwhitt-Drakes, its mansion, built by Robert Adam, 1759 61, with a Corinthian order for portico and pediment. Traversing the park and meadows, by the river, for a mile or so we come to Little Missenden and see the home of Benjamin Bates, M.D., who went with Flaxman to Rome, and for whom Angelica Kauffman painted her portrait. A warm patron of the fine arts, Bates died here at a very advanced age in 1828, being the last survivor of the Medmenham Abbey Club, whose imputed licence he always denied. The Abbess of Burnham acquired the manor in 1399. The little church has a fine Norman font and four bells, two said to be King John's gifts.

Rejoining the high-road we advanced to Great Missenden, where are the source of the Miss, or Mease, and scanty remains of a Benedictine monastery founded by Sir William de Missenden in 1133, or perhaps earlier by the D'Oyleys. The early English cruciform church was repaired and enlarged in 1830; its low embattled tower is oblong on plan, having its longer sides set north and south, like that at Chenies. On Castle Hill are some entrenchments, conjectured to be Roman. Following the Prince's Risborough-road for more than two miles we gain Hampden House gates. These open into the Queen's Gap (cut, traditionally, for a visit of Elizabeth) a wide clearing of greensward and bracken lined with elm, beech, lime and Spanish chestnut trees, rising for a mile and a quarter to the house's south front, opposite which, through the grounds may be traced Gryme's Dyke. This front, of red brick and partially stuccoed, was erected by the Hon. Robert Trevor, descendant of Hampden's daughter Ruth, and successor, in 1754, of John, twenty-fourth hereditary Lord of Great Hampden. The property belongs to the Earl of Buckinghamshire, who traces descent from Mary, Hampden's youngest daughter. Not far distant are Chequers, seat of the Russels, Cromwell's descendants; Great and Little Kimble, supposed to be named after Kunobelin. and once owned by the Hampdens; and Stoke Mandeville, where (in Prestwood and at Great Kimble) are the lands for which Hampden resisted the levy of ship-money. More remote, beyond Tring, is the Beacon at Ivinghoe, on whose summit they kindled a fire to speed to Harrow the news of Edge Hill.

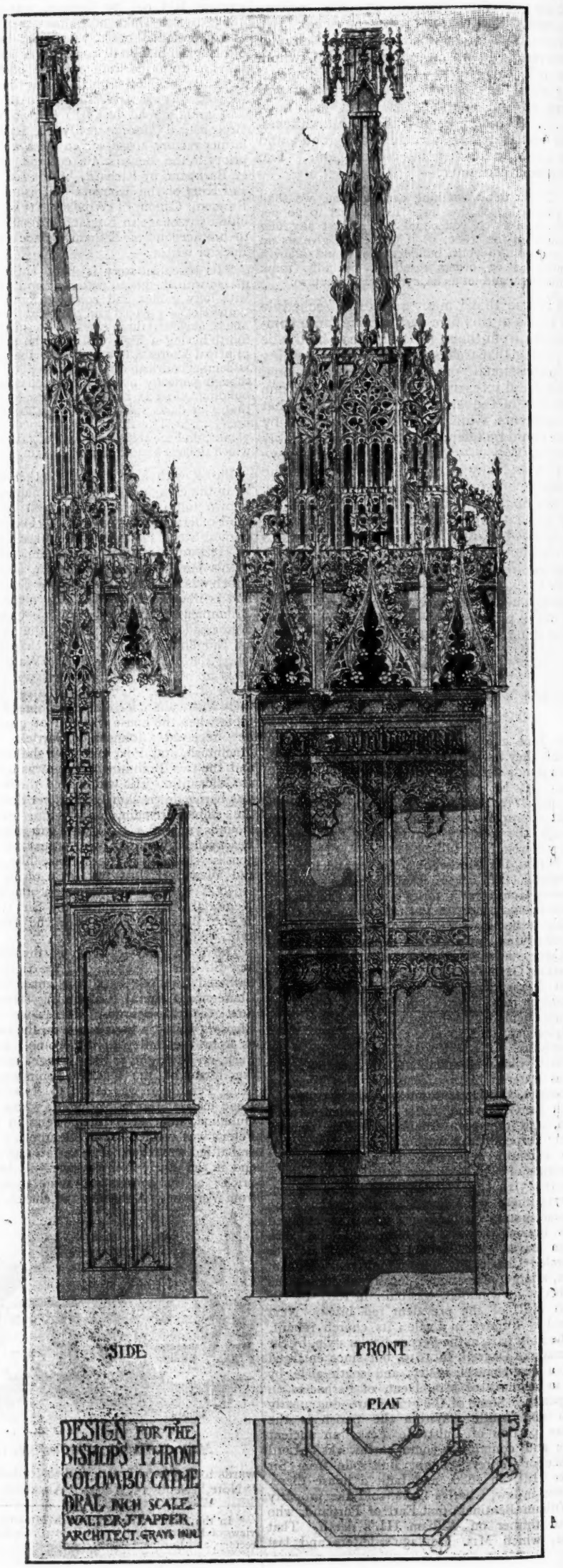
Despite Lord Nugent's dissection of Hampden's supposed remains, the precise cause of his death and the position of his grave are yet unknown. The house contains, we understand, only a reputed portrait that can be associated with him living. The sorry memorial on Chalgrove Field is in a shamefully neglected state. So after reading the inscription he set up to his first wife in the church chancel, opposite to that of his latter namesake, we pause to view the widening valleys, their sides clothed with dense woods, varied by the lesser growth of juniper, box, and holly, amongst which he passed his domestic life, and to recall Clarendon's words:—

"When this Parliament begun (being return'd knight of the shire for the county where he liv'd) the eyes of all men were fix'd upon him as their *Patriæ Pater*, and the pilot that must steer the vessel through the tempests and rocks which threaten'd it. And I am persuaded his power and interest, at that time, was greater to do good or hurt, than any man's in the kingdom, or than any man of his rank hath had in any time; for his reputation of honesty was universal, and his affections seem'd so publickly guided, that no corrupt or private ends could byass them."

BISHOP'S THRONE, COLOMBO CATHEDRAL.

THIS throne was placed in the cathedral church of Ceylon as a memorial to Bishop Chapman, its founder, by his surviving daughters.

It is made in teak, by native workmen, who were supplied with models for the carving by Messrs. Rattee & Kett, of Cambridge. The design is by Mr. W. J. Tapper. The drawing was exhibited at the Royal Academy.



Illustrations.

PRUDENTIAL ASSURANCE COMPANY'S BUILDINGS, EDINBURGH.

THE perspective view which we publish to-day represents a new block of buildings about to be erected by the Prudential Assurance Company for the accommodation of their Edinburgh branch, on a site at the corner of St. Andrew's-square and South St. Andrew's-street. The buildings, which have been designed by Messrs. A. Waterhouse & Son, are to contain not only public and other offices for the use of the Prudential Assurance Company but also some forty-five private offices, occupying the four upper floors, as well as four shops on the St. Andrew's-street side.

The most striking feature of the exterior will be the octagonal angle-tower at the junction of the two principal fronts, which will rise to the height of more than 100 ft.

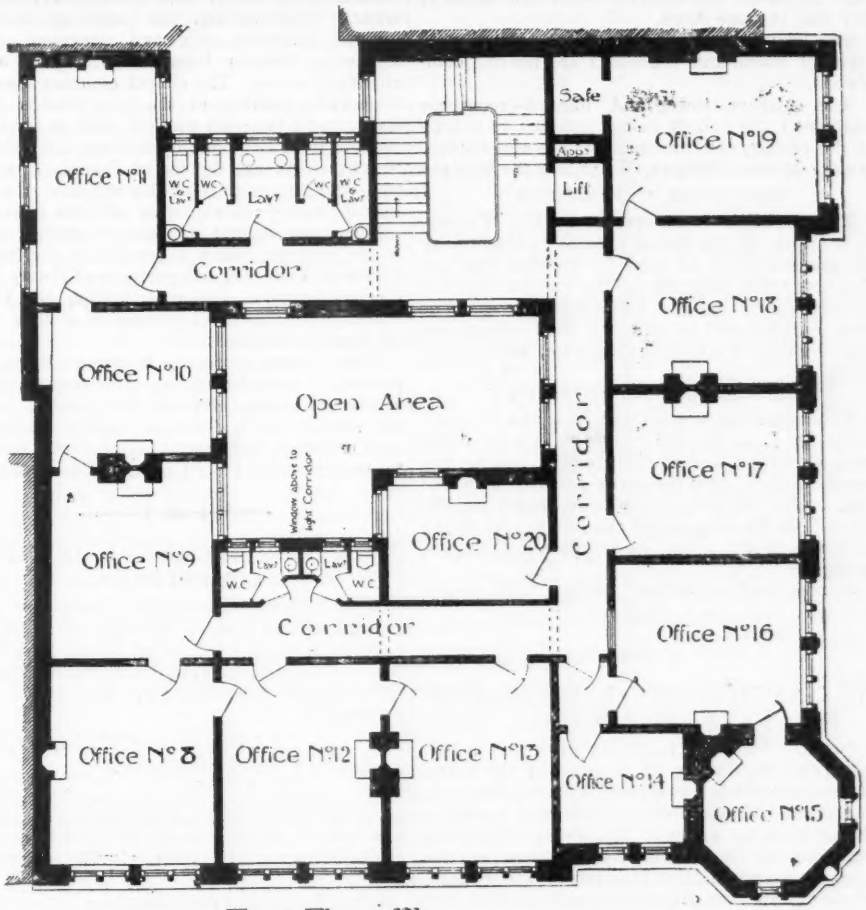
The elevations, originally intended to be executed in stone and red brick, are now at the express instance of the Municipal Authorities to be entirely of stone (Dumfriesshire), the lower portion of the front being of Peterhead granite up to the springing of the large arches.

That part of the building reserved by the Prudential Assurance Company for their own use is entered by an angle doorway at the base of the tower, and consists of a large public office, 49 ft. by 24 ft., with private offices and store-room behind. Of these, the public office is to be lined throughout with light coloured faïence.

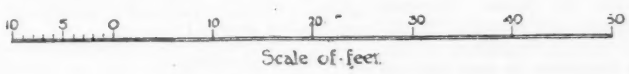
The entrance to such private offices as are not reserved by the company for their own use will be through a doorway situated at the other end of the St. Andrew's-square elevation, and leading directly to the staircase and hydraulic lift.

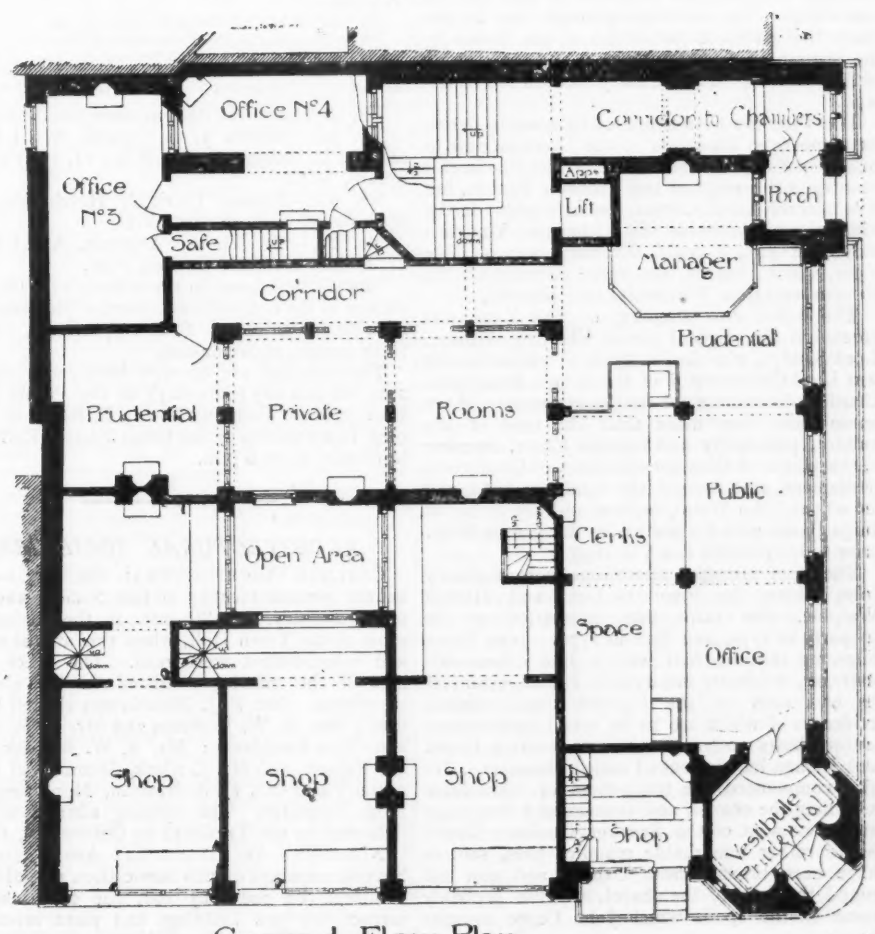
In connexion with these offices are provided strong rooms in the basement.

Each shop of the St. Andrew-street front, besides one or more large rooms on the ground-floor, with coal-vaults, &c., in the basement, will be provided with further accommodation on a mezzanine floor, introduced between the shops and the general first-floor level.



First Floor Plan





Ground Floor Plan

The Prudential Assurance Company's Offices, Edinburgh.—Plans.

CHURCH OF ST. SWITHIN, HITHER GREEN.

OF this church the nave and aisles only have been built at present. The view shows the interior looking westward.

The general scheme of the church is simple, the only elaboration being in the window tracery. The ceilings are intended for painting.

I am indebted to Mr. W. R. Lethaby for the whole of the detail work. During a prolonged absence from England on account of ill-health, while the work was in progress, Mr. Lethaby kindly took over my responsibilities, and I need not say that the church gained much by this arrangement.

The whole of the work was done by Messrs. Parmenter, of Braintree, Essex, to our complete satisfaction. The drawing is by Mr. Raffles Davison, and was made on the spot.

ERNEST NEWTON.

MODERN SCOTTISH HOUSES BUILT IN LOCAL STYLE.

THESE two sheets, showing various houses built in Scotland from the designs and under the superintendence of Mr. R. S. Lorimer, architect, illustrate the principle of employing in all cases local material and local workmanship, and thus producing houses characteristic of a stone-building district, instead of importing brick, half-timber work, and other materials and treatment foreign to the district. This is a principle which has been often spoken of with approval in our columns and elsewhere. Whether it would always be strictly appropriate in the building of a mansion of the largest size and importance, in a district where no building on that scale had previously existed, may be a question. But apart from such a case, there can be little question that with new houses of the average dimensions, the harmony of the buildings with the country in which they are erected is best secured by this method, and our readers will probably agree with us in thinking that Mr. Lorimer's experiments in this direction are of considerable interest.

The following description of the various houses is furnished by the architect:—

STRONACHULLIN.

This house was built of the local whinstone, and at the windows and external corners the angles were blunter and the harling (or roughcast) carried right round to get as great breadth of effect as possible, and also to save the expense of hewn stone, which was not procurable in the district. The roofs were covered with Easdale slates.

At the corner of the courtyard is a stable for a pair of ponies. The works were completed in June, and the house is now occupied as a shooting-lodge.

ELLARY.

This house was erected about twenty-five years ago from the designs of the late David Bryce. Eighteen months ago it was completely gutted by

fire. Some of the external walls were shaken, and had to come down.

The house has now been reconstructed with fireproof floors, and the works are nearing completion.

The entrance-tower and billiard-room are additions; the hall is being panelled in oak up to the ceiling, and the main stair is also finished in oak. Messrs. Milligan, of Ayr, are the builders.

NEW MANSE, WEST WEMYSS.

This manse is to be erected by Mr. Wemyss, of Wemyss, as the house presently occupied by the minister is to be used for another purpose. The house was designed in the manner that was once traditional in the Fife Coast towns. The local materials will be used, and the roofs covered with the thick Forfarshire grey slate, with a stone ridge.

THE "GRANGE," NORTH BERWICK.

This house was erected last year as a summer-house for Lord Traynor. The walls were of the local whinstone, harled, with cement harling and cream-washed, and the roofs covered with red tiles. The drawing-room was placed on the upper floor (in order to get the full benefit of the very fine views); the room has a high coved ceiling.

Stables and a walled garden, with angle-pavilions, were also carried out.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

THE VYNE, HAMPSHIRE.

A VERY small party of members of the Architectural Association went, on Saturday, the 14th, under the leadership of Mr. F. R. Farrow, to Basingstoke, for a visit to The Vyne. The party were met by Dr. Andrews, of Basingstoke, the local Secretary of the Hampshire Field Club, whose explanations of the topography and folk-lore of the district made very pleasant the three-mile walk from Basingstoke to The Vyne, which is in the parish of Sherborne St. John. Between Basingstoke and Sherborne one passes from the downland of the Chalk to the woodland of the Tertiary clay, and the transition is very marked and sharp. Dr. Andrews pointed out to the party the marks of habitation of the downs by the Britons and prehistoric men, and the absence of the dwellings of these early races in the woodland.

The Vyne has been supposed by some to derive its name from Vindomis of the Romans, and to be the spot of the first culture of the vine in this country in the reign of the Emperor Probus, but it is tolerably certain, from the data given in the itineraries of Antonine that, wherever Vindomis may have been, it could not have been at The Vyne, which, indeed, lies some distance off the Roman road from Winchester to Silchester.

The house now standing at The Vyne was erected in the reign of Henry VIII. by William, Lord Sandys, who died in 1542, at which time he was Lord Chamberlain of the king's household. Considerable alterations in the appearance of the house have been made since the time of the builder, principally by Chaloner Chute, Speaker of the House of Commons in Richard Cromwell's parliament, who bought the estate in 1654, and for whom, John Webb, nephew and son-in-law of Inigo Jones, added a portico on the garden-front, prior to his patron's death in 1659.

The other principal alterations were made by John Chute, the friend of Gray and Horace Walpole, who came into possession of the property in 1754, and died in 1776. John Chute filled up the old hall with a fine colonnaded staircase, evidently inspired by Italian examples he had seen on the "grand tour," further evidences of which are to be found in numerous antique busts and marble tablets, bearing Greek and Roman inscriptions of varied character. He also commenced the tomb-room or mausoleum adjoining the chapel, and containing a fine effigy and monument of the Speaker, Chaloner Chute. Some rather remarkable majolica tiles, said to have been brought from Urbino, and now laid round the floor of the chapel, are also probably some of the spoils which John Chute brought home.

The parts of the house which remain most nearly as the original builder left them are the long gallery and the chapel. The former is wainscotted with some remarkably fine linen panels and carvings of the arms, cyphers, and devices of many of his neighbours and friends at the Court of Henry VIII. Amongst others, the arms of Sandys, Powlett, St. John, Bishop Fox of Winchester, Archbishop Warham, Foster of Aldermaston, Bray, and Hungerford, may be seen. Unfortunately, the panelling has been grained imitation oak and varnished, which somewhat detracts from the beauty of a very charming room. The chapel contains some very remarkable carving in the poppy-heads of the stalls, and a beautiful window, said to have been brought from Boulogne by William, Lord Sandys, in 1532. As the figures of Francis I. and his two wives form part of the subjects, the glass must be nearly contemporary with the house.

There are several pictures of interest in the house, amongst others a portrait of the Speaker Chute by Vandyck, and portraits of Henry VIII; Charles Brandon, Duke of Suffolk, Sir Francis Bacon, and a beautiful picture of a Nun of the old family of Cufauds.

The chimney pieces are of various dates, some excellently carved oak, others of marble, but all worthy of notice. Several lock plates, bearing the initials W. S., are of capital design and workmanship, and resemble one to be found in the chapel of the Holy Ghost, at Basingstoke.

WEST HAM TECHNICAL INSTITUTE COMPETITION.

THE Technical Instruction Committee of the Council of the County Borough of West Ham have received the following report from Mr. J. Macvicar Anderson, F.R.I.B.A., with regard to the designs submitted in the above competitions:—

"6, Stratton-street, W., August 6, 1895.

To the Council of the County Borough of West Ham.

GENTLEMEN,—Having very carefully examined each one of the seventy-three sets of designs that have been submitted in competition for the Technical Institute and Public Library which it is proposed to erect on the site in Romford-road known as The Green, I beg leave to report that having regard to—

(*a*) The conditions of the competition;

(*b*) The by-laws of the borough, which, by the conditions, had to be complied with;

(*c*) The general merit in design, more particularly excellence of plan, to which the attention of competitors was specially directed;

(*d*) The adaptability of the designs for the intended purpose of the buildings.

I award—

The first place to the design marked No. 34.

The second place to the design marked No. 51.

The third place to the design marked No. 22.

I have the honour to be, Gentlemen, your obedient servant. (Signed) J. MACVICAR ANDERSON."

The authors of the designs were found to be—

No. 34.—Messrs. J. S. Gibson, A.R.I.B.A., and S. B. Russell, A.R.I.B.A., 11, Gray's Inn-square, W.C.

No. 51.—Messrs. Clark & Hutchinson, 28, John-street, Bedford-row, W.C.

No. 22.—Mr. Thomas Davison, A.R.I.B.A., 11, Oakley-crescent, Chelsea, S.W.

The Council have, in accordance with the conditions of the competition, awarded the premiums of 250*l.*, 150*l.*, and 100*l.* respectively, to the three designs above named.

The drawings are on view from Saturday, the 21st, till this day (Saturday), at the Public Hall, Barking-road, Canning Town, E. (close to Canning Town station on the Great Eastern Railway), from 10 a.m. to 6 p.m.

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL SOCIETY.—The annual general meeting of this Society was held on Wednesday, the 18th inst., in the committee-room at the Town Hall, when the annual report and balance-sheet were read. The other business of the meeting consisted in the election of officers. Mr. F. J. Nickols was elected President; Mr. A. W. Johnston and Mr. P. F. Ruthven, Vice-Presidents; Mr. S. W. B. Jack, Mr. W. Pogson, and Mr. J. Slack, Members of Committee; and Mr. E. B. Newton, Hon. Sec. and Hon. Treasurer. The opening address will be delivered by the President on October 29, 1895.

NORTHERN ARCHITECTURAL ASSOCIATION.—Several members of this Association assembled at Wallsend on Saturday last, the 21st inst., to inspect the new buildings and plant erected at the shipbuilding yards of Messrs. C. S. Swan & Hunter. Mr. Hunter explained that these yards occupied an area of about twenty-three acres, and in each yard there were three building slips capable of building steamers of the largest size. During the last four years a great many additions had been and were being made, including a new joiners' shop, 184 ft. by 80 ft.; smiths' shop, 140 ft. by 80 ft., fitting shop, electric power house, two additional boilers of the Babcock-Wilcox water-tube type, electric plant consisting of three powerful dynamos, driven by a compound Robey engine, four powerful electric cranes, electric machine motors for outlying machines, and an installation of arc and incandescent lights. The electric installation was on the continuous current system, working at 110 volts, and at present provided for about 200 brake horse-power in addition to the lighting. The electric cranes consisted of two revolving travellers working overhead, and capable of running the full length of the ships' berths, each capable of lifting three tons and travelling at a speed of 300 ft. per minute; a cantilever crane, working on the top of the roof, to lift the same weights at a similar speed, and with a span of 65 ft., also an electric jib crane for racking plates up to three tons weight on the ground level. The generating plant and the two first-mentioned cranes and the machine motors were by Messrs. Clarke, Chapman, & Co., of Gateshead. The two latter cranes were by Messrs. Thomas Broadbent & Sons, Huddersfield. The firm had greatly extended their use of hydraulic power for various purposes. It was intended to hydraulic rivet beam ends, stringer plates and bars, keel plates, intercostal plates, &c., as well as the usual hydraulic frame rivetting. The most novel features in the yard were the steel sheds, under which it is intended to build steamers of the largest class, and from the roof of which the electric cranes are worked. The new sheds are 68 ft. broad, clear of the standards, 80 ft. high in the clear, and at present 450 ft. long, but are intended to be made 600 ft. long as soon as that length is required to deal with the increased lengths of steamships which are now being adopted. The principal features of the structure have been designed by Mr. F. Caws, of Sunderland.

COMPETITIONS.

ALTERATIONS TO MUNICIPAL BUILDINGS, ABERDEEN—In connexion with the proposed reconstruction of these buildings, the difficulty formerly alluded to has been considered by the Town Council's Finance Committee. The Burgh Surveyor reported that, while, in order to meet the requirements of the different departments a floor space of 25,000 square ft. would be necessary, he found on measurement that only about 20,000 were available on the first and second floors. The committee resolved to appoint a professional arbiter to lay down the conditions of competition and decide on the plans.

Correspondence.

To the Editor of THE BUILDER.

A BUILDERS' CLERKS' ASSOCIATION.

SIR,—Referring to the suggestion made in the current number of your journal as to the establishment of an Institution for the benefit of builders' clerks, may I be permitted to remind your readers that such an Institution is already in existence, and has had an active career, if I may so put it, for nearly thirty years.

Almost all the leading builders of London have been its Presidents from year to year, and it might fairly be thought that the Institution is well known: at any rate, it *is* well known to those who want relief.

Its objects are to grant pensions of 25*l.* per annum to clerks who are past work or incapacitated, and of 20*l.* per annum to widows, also to provide board and education to their orphans; and further it makes grants as temporary reliefs to clerks in cases of urgent distress.

All particulars may be obtained on applying to me at the offices of the "Builders' Clerks' Benevolent Institution," 21, New Bridge-street, Blackfriars, E.C.

If you will kindly insert this in your next issue I shall be greatly obliged.

H. J. WHEATLEY,
Secretary.

*** We are very glad to print Mr. Wheatley's letter to correct a possible misapprehension, but we take it that our correspondent did not refer to a provident society for Builders' Clerks, but to a society for mutual improvement and support, and for keeping up the status of their calling, which is not quite the same thing as a provident or benevolent society.—ED.

CHANGE OF ADDRESS.—Messrs. T. A. Lumley & Co., land agents and auctioneers, have removed from 35, St. James's-street, to "Lumley House," No. 34 in the same street.

The Student's Column.

METALS USED IN BUILDING.—XIII.

COMMON PHYSICAL PROPERTIES.

IT is not essential that substances shall be melted to form alloys; they may be produced by the application of pressure, and it has been shown that although the compression is accompanied by the evolution of heat, the heat is not sufficient to melt the substancee to be united, but that the union is effected much below the melting-point of the metals concerned. From a physical standpoint, such a phenomenon is pregnant with interest, and although its practical applications must be somewhat limited, from circumstances immediately to be referred to, it may well be enquired whether in certain cases such properties may not assist us to understand the deterioration by molecular alteration which in the end produces what is commonly called "fatigue."

To fully appreciate the foregoing it is desirable to state a few of the more important facts concerning fusion. Experiment has demonstrated* that the fusion of bodies is governed by the two following laws:—

I.—Every substance begins to fuse at a certain temperature, which is invariable for each substance, if the pressure be constant.

II.—Whatever be the intensity of the source of heat, from the moment fusion begins, the temperature of the body ceases to rise, and remains constant until the fusion is complete.

Under normal conditions the following are the melting-points of divers common metals, &c., expressed in degrees Centigrade:—

Melting-points of Metals and Substances used in Alloys.

	Deg.		Deg.
Mercury	−38·8	Antimony	450
Phosphorus	+44	Arsenic	500
Potassium	55	Magnesium	750
Sodium	90	Aluminium	850
Sulphur	114	Silver	954
Tin	228	Gold	1,035
Bismuth	246	Copper	1,054
Cadmium	321	Iron	1,500
Lead	335	Platinum	1,775
Zinc	422		

Certain substances are said to be refractory, that is, incapable of being fused. As a matter of fact, however, we have no right to regard them in that light, since the circumstance that we cannot melt them arises from the imperfection of our methods for causing fusion. Every year sees improvements in that connexion, and since the employment of the electric furnace the vast majority of so-called infusible substances have had to succumb to its influence. At the same time, it is doubtful whether we are altogether justified in abolishing the term "refractory," and it is convenient to retain it for substances that are exceedingly difficult of fusion. Foremost amongst these are the divers kinds of fire-clay, from which fire-bricks, common crucibles, and the linings of many furnaces are made. The kind of refractory material used in any particular case depends on the nature of the operation to be performed. Pure quartzose sand is a highly refractory substance, and it is used either alone as a lining for the beds of reverberatory furnaces, or mixed with fire-clay. Alumina is equally infusible, but possesses the additional advantage of not combining with bases, except in rare instances. Even where it does combine, and the lining is thereby injured, the aluminates are not so fusible as the silicates formed when quartzose matter is used. The infusible properties possessed by lime and magnesia are utilised, to some extent, in furnaces for the manufacture of steel. These substances are very basic, and naturally form fusible compounds with acids, such as are usually found in many ores. The blocks for lining furnaces, made from lime and magnesia, are termed basic bricks. Fire-clay is a natural substance compounded, for the most part, of the minerals and other matters just alluded to. It is a hydrated silicate of alumina containing lime, magnesia, iron, &c., but these latter must not be present in sufficient proportions to cause them to assume fluxing properties. In addition to vessels made of fire-clay, the metallurgist uses crucibles of platinum and other bodies.

Certain substances pass from the solid to the liquid state without showing any definite melting-point; iron, for example, becomes gradually softer and softer when heated, and passes by imperceptible gradations from a solid to a liquid. This intermediate condition is called "vitreous fusion," and the melting-point is calculated from the lowest temperature at which perceptible softening occurs.

To return to the subject referred to at the commencement of this article, it may be noted that Lord Kelvin and others have deduced from the mechanical theory of heat that with an increased pressure the melting-point of a body must be raised. All bodies which expand on passing from the solid to the liquid condition have to perform external work in doing so, but under ordinary circumstances the amount of this work is so small that it may be neglected. If the external pressure be increased, however, the power of overcoming it can only be obtained by an increase of active work on the part of the molecules. This may be brought about by the temperature of fusion being increased. To accomplish union between two substances through the medium of pressure, it follows that on the pressure being applied the point of fusion is increased in proportion to the amount of pressure exerted, so that although a considerable amount of heat is generated in the substance compressed, by the process, the melting-point being increased *pro ratâ*, the time would never arrive when by the mere act of compression the substance could be melted. It is conceivable that a metal could thus be raised far above its point of fusion, and yet remain in the solid state. If the pressure were removed very slowly the substance compressed might return to normal atmospheric conditions without having been melted. If, on the other hand, the pressure were suddenly removed, the substance would tend to flash into a molten state.

The question presented in uniting two substances so as to form a metallic alloy by pressure is whether the union is brought about by the substances being melted (1) during the act of compression by the heat generated; or (2) after the pressure is more or less suddenly removed; or whether the alloy is formed by (3) a purely mechanical means by being rendered intimately compact by the mere act of compression. We do not see how the union could physically be formed by the first process alluded to, but both the others may possibly do the work, though we have slightly anticipated by stating that "the union is effected much below the melting-point of the metals concerned"—thereby implying that fusion does not take place. We know that the point is a disputable one, but we are fortified in our position by the results of the researches of more than one Continental metallurgist.

The union of substances by pressure has been investigated in great detail by Professor Spring, of Liege,* and the results obtained are admirably summarised by Mr. Hiorns, of Birmingham.† He produced alloys by strongly compressing powders of the constituent metals. The powders were placed under a short cylinder of steel in the cavity of a steel block divided vertically, held together by a collar, and placed in a chamber made of gun-metal, which may be rendered vacuous. The pressure was applied to a cylindrical rod passing through a stuffing-box. Under a pressure of about 2,000 atmospheres lead filings were made into a solid block, and at 5,000 the metal was made to flow readily, like a liquid. The following table shows the amount of compression required to unite the powders of the respective metals mentioned:—

Union of Metallic Powders by Pressure.

Lead	unites at	13	tons per	square inch.
Tin	,,	19	,,	,,
Zinc	,,	38	,,	,,
Antimony	,,	38	,,	,,
Aluminium	,,	38	,,	,,
Bismuth	,,	38	,,	,,
Copper	,,	33	,,	,,
Lead	flows at	33	,,	,,
Tin	,,	47	,,	,,

The property of metals flowing under the influence of pressure is largely taken advantage of in the industrial arts. Lead pipes, for instance, may thus be made; electric cables for certain purposes are sheathed with the same metal by this means. Although this property is important enough, in a commercial sense, we think its teachings as to the composition, or structure, assumed by metal under the conditions named are of the highest practical value. This structure has been little investigated, and it is with the special object of calling attention to its importance that we have entered so much into detail concerning the formation of alloys by pressure.

When molten metals cool, the majority (if not all) have crystal or granular aggregates formed within them. This crystalline structure may or may not be visible to the naked eye, but in any case, on its mode of development, the value of the metal for structural purposes largely depends. If we could in all cases control the formation of this structure, and especially if we could direct the orientation of the incipient crystals involved, we could vastly increase the strength and lasting properties of several metals used in building. We can do this with some metals and alloys to a certain extent, but we are yet on the threshold of the subject, and it is too early to dogmatise. Probably no property possessed by metals is being more actively investigated at the present time than is that of structure, due to divers influences and under set conditions. Certainly, none of the attributes of artificial metals is more important from a practical point of view. The so-called "fibre" of metals, although it can be induced in direction in several instances, will, in future, be entirely understood and controlled. The problem of brittleness will also be solved. In the meantime we may draw the student's attention to the more salient laws that may be demonstrated to govern the crystallisation of molten matter, and it will be convenient to do so by referring to the results of experiments.

In order that the particles of a definite chemical compound may disengage themselves from other matter, and arrange themselves to form a crystal, several conditions must be fulfilled:—

a. During the process of solidification, the constituent particles must have freedom of translation towards each other, so that, under the influence of the mutual actions, their centres may take definite relative positions.

b. Also, the constituent particles must have freedom of rotation, so that under the influence of the mutual actions, their similar parts may take definite orientations.

c. The requisite length of time must be allowed for the completion of these operations.

In order that a crystal may continue to grow, it must be enveloped in or be sufficiently near to particles of appropriate material which are situated in the conditions enumerated above in paragraphs *a* and *b*; these particles must be allowed sufficient time to reach the crystal and to fall into position, and they must be of such a nature as that they can pass to the solid state. All these conditions must be fulfilled when a substance is fused and permitted to *slowly* cool to a temperature below that of solidification, if a thoroughly crystalline structure is to be set up therein. But if the substance be suffered to cool *rapidly*, certain of the requisite conditions are absent. *Inter alia* a sufficient amount of time is not allowed. The result is that the bulk of the molten material assumes an amorphous aspect, with, perhaps, a number of crystallites, skeleton crystals, or incipient crystals—all of them microscopic in size—developed throughout. The student will readily understand that such a material cannot possess the same physical attributes as the same substance would do had it (if possible) been cooled in such a manner as that a really crystalline structure had been developed.

Professors Bloxam and Huntington, in their work on "Metals" (p. 155), remark that the more gradually molten cast-iron is allowed to cool the larger will be the crystalline structure developed on solidification, from which it follows that the metal near the surface of a casting will be much finer in grain than that at the centre. In large castings, where, owing to the thickness and the mass of metal, the centre must of necessity cool slowly, the effect of the difference in the crystalline structure is of considerable importance, as it materially affects the strength of the casting. We cannot, however, altogether endorse the same authors' statement that "when any substance crystallises, the crystallisation always takes place at right-angles to the surfaces at which cooling, or heating, takes place; in other words, the crystals will be formed so that their principal axes will be at right-angles to the surfaces bounding the mass." This is perfectly true with iron and a few other metals, but it does not hold good for every substance. The practical importance of the matter may be illustrated by the following remarks. If a square bar be cast and cooled uniformly in all directions, there will, according to the foregoing rule, be regions in which the long crystals springing from adjacent sides will meet. The line of junction must of necessity be a line of weakness. If, on the other

* Atkinson, "Ganot's Physics," fourteenth edition (1893), p. 318.

* "Bull. l'Acad. de Belgique," 2e series, vol. XLV. (1878); *id.* vol. XLIX. (1880); "Bull. Soc. Chim.," Paris, vol. XLI. (1884).

† "Mixed Metals," 1890, pp. 72-74.

hand, the bar be cast round, using the same metal, the prismatic crystals springing from the sides meet together in the centre, and no line of special weakness results. The structure of certain metals is materially modified on their being passed between rolls, or drawn out, but we will not enter into that at present.

The process of fusing metals causes them to assume different colours in the furnace, which property has been used to determine the degree of temperature arrived at in successive stages of the operation. Pouillet has devised the following scheme:—

Incipient red heat corresponds to		525° C.
Dull red	,,	700
Incipient cherry red	,,	800
Cherry red	,,	900
Clear cherry red	,,	1,000
Deep Orange	,,	1,100
Clear Orange	,,	1,200
White	,,	1,300
Bright White	,,	1,400
Dazzling White	,,	1,500

The temperature calculated by this means is of necessity very approximate; the pyrometer must be employed to obtain more accurate results.

Alloys are generally more fusible than any of the metals of which they are composed; for example, an alloy of five parts tin to one of lead, fuses at 194° C. Steel melts at a lower temperature than iron, though it contains carbon, which latter is highly refractory. An application of this property is met with in the case of fluxes, substances which, when added to an ore, help the reduction of the ore to the metallic state, and promote the agglomeration of the individual particles with the formation of a mass of metal, or regulus.

GENERAL BUILDING NEWS.

NEW CHURCH, EAST LAYTON, YORKS.—On Thursday, September 19, this church was opened, the dedication ceremony being performed by the Bishop of Richmond. The general style is Late Tudor, with elaborate mouldings and other details in the style of King's College Chapel, Cambridge, and Henry VII. Chapel, Westminster Abbey. The east gable end contains a five-light window, and the west a four-light. The tower is furnished with a three-light window on each face, with octagon buttresses at the angles, surmounted by ogee-headed canopies. All the windows have richly-moulded jambs, arches, mullions, and tracery, and the doorways correspond. Internally the walls are lined with finely-dressed stone, the windows and doors having small pillars in the moulded jambs. The four piers and arches of the tower are also deeply moulded. Mr. Ebner, of London, supplied the marble mosaic for the floor; Messrs. Hart, Peard, & Co., Birmingham, the iron-work; and Messrs. Richardson & Co., Darlington, the heating apparatus. The stone used was from the neighbouring Forcett quarry, and the roof is covered with brown Welsh tiles. Mr. Dodds, of Gilling, was mason, and acted as clerk of works, the architect being Mr. J. P. Pritchett, of Darlington.

NEW ACADEMY, DUMFRIES, N.B.—The school board of Dumfries have undertaken the erection of a new academy, the accepted estimates for which amount to about 12,000*l.*, and the foundation-stone was laid on Saturday, the 21st inst. The contractors for the masonry and joinery work are Messrs. Houston & Robinson, and Mr. M'Lachlan, respectively. The architect is Mr. Frank Carruthers, of Dumfries and Lockerbie.

ST. MARK'S CHURCH, JARROW.—The church recently erected in Salem-street, Jarrow, was opened on the 21st inst. It has been designed to accommodate 300 persons, including choir, the nave seating 276 and the chancel 24. The style is Late Gothic, the doors and windows being of simple character. The nave and chancel are divided by a four-centred arch in stone. The vestries on the north side comprise a room on the ground floor for the choir, with a clergy vestry over. The materials employed are Hebburn stone, the roofs, which are of open timber on the inside, being covered on the exterior with green Westmorland slates. The heating is by hot water on the low-pressure system, fitted by Messrs. Walker & Son, of Newcastle. The windows have been glazed by the Gateshead Stained Glass Company. The general contractor was Mr. Stewart Craig, of Jarrow, the contract price for the work being 2,000*l.*, and the total cost of the building will be about 2,500*l.* The architects were Messrs. Armstrong & Knowles, of Newcastle-on-Tyne.

FREE CHURCH, MUTHILL, N.B.—On Saturday last, the 21st inst., the memorial stone of the Free Church in course of erection at Muthill, Perthshire, was laid by Mr. Samuel Smith, M.P. The edifice is described by the *Scotsman* as French Gothic in style. The principal front is towards Drummond-street, and shows a large buttressed gable with a traceried window and central arched and recessed doorway. On either side of the latter, are double-arched windows to the vestibule and cloak-room. A tower is placed at the west corner in a line with the front gable of the church, having a battlement course at the top of the masonry, and finished with a slated spire. A gallery is arranged over the vestibule, and sittings have been provided in the church for from 400 to 500 persons. A hall is arranged at the south end. The plans are by Mr. G. T. Ewing, architect, Crieff, and the total cost is expected to be about £2,000.

SCHOOL BUILDINGS, GLOUCESTER. — Large schools have recently been erected in the Linden-road, for the Gloucester School Board, and were opened on the 16th inst. A special feature in the buildings is the system of ventilation adopted, which may be described as follows:—The buildings as a whole will be warmed by a low-pressure hot-water service with coils and radiators in the several rooms and corridors. The ventilation of the class-rooms, cloak-rooms, &c., will be effected by inlets for external fresh air at the backs of the hot-water coils, and foul-air flues, carried underground to the base of the ventilating tower. The latter is 3 ft. 6 in. square inside, and within this is a cast-iron smoke-flue 15 in. diameter, to convey the smoke from the hot-water boiler to the top of the tower, whilst the heat of the smoke-flue will form a vacuum to draw the foul air to the louvred openings near the top of the tower. For summer ventilation a small stove is provided to warm the smoke-flue for the same purpose. This work was carried out by Messrs. Haden & Son, of Trowbridge. The central hall and infants' department are ventilated by similar inlets to those just described, with Boyle's air-pump roof ventilators. The buildings are constructed of Severn-side bricks faced externally with plastic pressed bricks, and terra-cotta from the Wilderness works, near Mitcheldean, whilst the roof of the central hall, infants' department, and front buildings are covered with Broseley tiles. The builders were Messrs. Gurney Brothers, of Gloucester, and the architect Mr. M. H. Medland.

NEW CHURCH, GLASGOW.—The memorial-stone of the building to be known as Langside Free Church was laid on Saturday last, the 21st inst. In reality it is to comprise a vestry, sessions-house, a ladies' parlour, kitchen, a large class-room, and a public-hall, besides the church accommodation. The *Scotsman* states that it is to cost 10,000*l.*, and is designed in the Græco-Roman style, with modern adaptations. The main entrance to the church has a massive doorway divided into three compartments by pilasters and imposts, over which is a moulded cornice. Surmounting the entrance is an Ionic portico, composed of six columns supporting an entablature and pediment of a simple character. Ascending a flight of broad steps, balanced with die walls and pedestals for ornamental lamps, the main entrance gives access to the vestibule, which is lighted from the roof under the portico. On either side are circular staircases leading to the galleries. The sittings are planned like an amphitheatre, the pews radiating from a centre and the floor sloped all round. The organ recess is situated behind the pulpit-platform, and in front of the latter accommodation is provided for the choir. The architect is Mr. Alexander Skirking.

PRIMITIVE METHODIST CHAPEL, LEEDS. — A chapel recently erected in Cardigan-road, Leeds, was opened last week. It is built in the thirteenth-century English Gothic style, of Burley pitch-faced stone with Horsforth stone dressings, covered with Bangor slates; the windows are glazed with cathedral glass in leaded lights. The nave is divided from the aisles by stone arcading, and the roofs covering both are open-timbered and boarded. The minister's vestry, heating chamber, &c., are under the choir in the apse at the south end. The chapel is ventilated by numerous inlets, the foul air being extracted by a large slated wood ventilator on the ridge of the nave roof. The cost of the whole was about 2,200*l.* The principal contractors were Messrs. G. Nettleton & Sons, masons, Roundhay; Messrs. H. Atkinson & Sons, joiners, Carlton-hill; Mr. J. Season, slater, Hunslet New-road; and Mr. W. J. Haddock, plasterer, Harehills-road. The architects were Messrs. Howdill & Howdill, of Albion-street, Leeds.

CONCERT HALL, BLACKHEATH. — This hall, which is being erected by the Blackheath Concert Hall Company, is rapidly approaching completion, and will, it is anticipated, be opened in the course of next month. The exterior of the building is decorated with Gesso Duro work executed by Mr. Scale, sculptor, and is faced with pressed bricks and terra-cotta dressings. There are two approaches. On passing through the main entrance is a lofty hall, on either side of which are the secretary's office and other rooms. The main hall itself, which from the lower end to the proscenium arch is 94 ft. in length and 58 ft. in width, is a lofty building, well lighted and ventilated, and provided with seven exits, in compliance with the regulations of the London County Council. The floor is constructed for dancing purposes, is tongued and laid on concrete, and the roof is panelled with elaborate Goloach moulding. The stage, which is 29 ft. in depth, and has a drop of one in fifteen, is specially adapted for operatic and orchestral work. For recitals and entertainments of a like character a removable platform will be affixed, which will have the effect of levelling up the stage. The main hall will accommodate 1,000 persons, and over 200 can find seating-room on the stage. Ample exits in case of fire are provided by seven doors in the main hall. The whole building will be warmed by a powerful heating apparatus. The artistes' rooms are immediately under the stage. Turning from the main hall there is on the same floor a smaller room for meetings, &c. Upstairs is a small hall, laid with a dancing and fireproof floor, which will be provided with a movable stage, 20 ft. by 10 ft. This room, which is said to hold upwards of 300 people, is built for minor entertainments. At the left side of the main hall it has been decided to erect, early in the new year, a building for the sole use of the Blackheath Conservatoire of Music. Mr. J. O. Richardson, of Peckham, is the builder, and the architects are Messrs. Edmeston & Gabriel.

ASYLUM, HAWKHEAD, GOVAN, N.B.—On the 18th inst. the asylum buildings recently erected for the Govan district at Hawkhead were opened. The whole scheme, however, is not yet complete. The asylum proper is practically finished, but the hospital and other buildings are in course of erection; it is anticipated that these latter will be completed in about eighteen months. The *Glasgow Herald* states that the asylum consists of four blocks, two of which will accommodate 140 male and two 140 female patients. Dividing the male and female patients' blocks is a series of buildings, comprising the administrative department, consisting of dining-hall, kitchen, attendants' dining-rooms, &c., and general store on the ground floor; and on the upper floor a spacious recreation-hall, with large stage and property-rooms. Immediately in front of the general store is the official block. East of the asylum the hospital, which will have accommodation for 144 patients, is situated, and will comprise blocks for the treatment of recent and acute cases, infectious diseases, and sick and infirm cases respectively. Separating the portions for the male and female patients respectively is a central building, comprising entrance hall, waiting-rooms, observation departments, offices, and surgery, with administrative offices behind, and a large dining-hall for the use of the patients. Some distance from the wing for females are the laundries, whilst the workshops will be close to the side for males. The house of the medical superintendent close by is estimated to cost about 2,000*l.* On the west boundary of the grounds are the farm buildings, with a house attached, which contains additional room for seven patients, with day-room and dormitory. The present buildings will have accommodation for 431 patients, but provision has been made for future extensions, which will enable the number to be increased to 761. The heating of the whole establishment will be by steam on the low-pressure system. Particular attention has been paid to the ventilation. The total cost of the asylum is estimated at 141,611*l.* The architect is Mr. Malcolm Stark, of St. Vincent-street, Glasgow.

ROMAN CATHOLIC CHURCH, BALSALL HEATH, BIRMINGHAM.—The foundation-stone of the new Roman Catholic Church of St. John the Evangelist, which is being erected in George-street, Balsall Heath, was laid on the 12th inst. The building is designed in the Early English style. The contractors are Messrs. Harley & Sons, and the estimated cost is 3,500*l.* Mr. A. H. Vicars, Strand, London, is the architect.

UPTON ASYLUM, CHESHIRE. — At a recent meeting of the Cheshire County Council a proposition for the extension of the asylum was discussed. The committee appointed to investigate the matter had directed the attention of the architects to ascertain whether any reduction could be made in the estimates, and the effect was a considerable reduction, amounting for the present to 9,059*l.*, which reduced the builder's tender from 79,500*l.* to 70,441*l.* Alluding to the discrepancy in the architects' estimates for the work and the lowest tender sent in by Messrs. Jones & Son, of Liverpool, some time ago, the Chairman said that Messrs. Grayson & Ould, the architects, of Liverpool, had submitted their list of reductions as follows:—Reduce size of water-tower, 1,800*l.*; common bricks in lieu of Ruabon wire-cut facing-bricks, 829*l.*; less cost of glazed bricks as between first and second quality, 339*l.*; bakery, less fittings, 171*l.*; saving in grates and chimney-pieces, 509*l.*; sundries, 407*l.*; less cost of fireproof flooring, wood-block paving, &c., 1,560*l.*; portion of provision of brickwork, 500*l.*; brick coping to flats, brick cornices to chimneys in lieu of stone and less stone-work administrative block, carving corbels dining-hall, 640*l.*; omit sash locks to windows and less cost of ironmongery, 414*l.*; dado framing, ornamental ceiling committee-room, dado rail, &c., corridors and dining-room, and covering main pipes with non-conducting material, 657*l.*; less cost of baths, 200*l.*; less cost of heating and ventilation, 1,033*l.*—total, 9,059*l.* The architects stated that, as they had had an opportunity of examining Messrs. Jones & Son's priced quantities, they were in a position to state positively that the rise in wages, which had taken place within the last two years, together with the probabilities of a further increase during the progress of the contract, largely accounted for the difference between their tender and the original estimate.

SANITARY AND ENGINEERING NEWS.

CHEDDINGTON SEWERAGE.—The Linslade Rural District Council has appointed Mr. H. Bertram Nichols, C.E., of Birmingham, to prepare a report on the sewerage and sewage disposal of the parish of Cheddington.

WATER SUPPLY, MALVERN LINK.—The Link District Council have at length decided to adopt the scheme of Mr. Baldwin Latham, C.E., for supplying the neighbourhood with water. At a public meeting held last week it was resolved that a Bill be promoted in the ensuing session to extend the district of the Malvern Link Urban District Council so as to include a portion of the Parish of Cradley, in the County of Hereford, and for the construction and maintenance of works for the supply of water within the Malvern Link Urban District, and within such other parishes and places as may be prescribed by the Bill, and for other purposes. Briefly, the Engineer's scheme comprises the construction of a reservoir at West Malvern (which is in the Link district) in a natural basin into which the water from rainfall and springs on the west side of the Malvern Hills will be drained by means of catch-water drains, &c., and the supply given to the Link Urban District by gravitation. The portion of Cradley to be taken into the district lies between two portions of the Link district. The proposed reservoir is to hold thirty million gallons—giving a supply of twenty gallons per head for a period of 200 days. The estimated cost for the construction of the works, contingencies, land, Parliamentary and other expenses, is 36,095*l.*

SEWERAGE WORKS, KING'S NORTON.—The inauguration of the system of sewerage works which have been in hand for several years past at Lifford, near King's Norton, took place on Tuesday last, the 24th inst. The *Birmingham Daily Gazette* says that, in reviewing the history of the undertaking the chairman of the Rural District Council remarked that, to convey the sewage from recently-developed portions of their district over a hilly country, the Rural Sanitary Authority decided to adopt Mr. Godfrey's plan by utilising compressed air. By this method of lifting, one set of engines actuated the sewage at any number of points, and instead of several pumping-stations scattered over the district one central station supplied all the power required. From the central station at Lifford compressed air was sent through a 3-in. main for a distance of nearly 2,000 yards to Ejector Station No. 1, in which were placed two ejectors of 100 gallons capacity. Either of these could be worked separately or together. As soon as one was full of sewage an automatic arrangement liberated the compressed air at a pressure of 40 lbs. to the square inch, and as soon as the valve opened, the sewage was lifted through a 6-in. main rising to a vertical height of 80 ft. to a manhole, from which it fell by gravitation to Ejector Station No. 2, where another pair of ejectors were placed of 150 gallons capacity. These ejectors received not only the sewage from Station No. 1, but all that which flowed by gravitation from Middleton Hall-road, Camp-lane, and the village of King's Norton. From these ejectors the sewage was discharged through an 8-in. main up a vertical lift of 30 ft. into the tanks. The ejectors would discharge 600 gallons per minute when worked continuously, or forty gallons per head per day from a population of 21,600 persons. The village of King's Norton and Middleton Hall-road contained 1,600 persons, while on the extension area 341 houses had been approved within the last four years, making a total population of about 4,000, so that the plant put down was ample for many years to come. The crude sewage would be treated with lime, alum, &c., to precipitate the suspended matter. Then the effluent would be subjected to carbonic acid gas and a germicide to make it sterile, after which it would filter through Thwaite's filters and pass into the stream. Messrs. Hope had undertaken the treatment of the sewage. The contractors for the sewers and buildings were Messrs. Currall & Lewis; for the machinery, Messrs. Hughes & Lancaster; for the boilers, Mr. E. Danks. The scheme was prepared by Mr. Godfrey, the Engineer to the Council, and the execution of the works had been in charge of Mr. J. H. Webb, Assistant-Surveyor.

THE SANITATION OF BISHOP AUCKLAND.—A Local Government Board inquiry was held at Bishop Auckland on the 12th inst., by Dr. R. Deane Sweeting on the question of the application by the County Council to the Board for the issue of an order under Section 42 of the Public Health Act, 1875, requiring the Rural District Council of Auckland to undertake the cleansing of ashpits and scavenging of several important townships in the district. Dr. Hill, the county medical officer, attended, and submitted evidence in support of the order, quoting freely from his reports to the County Council on the unsatisfactory scavenging arrangements. There was a large attendance at the inquiry, and the order was opposed in regard to many of the townships—particularly Crook and Billy-row, and places where colliery companies at present carry out the scavenging in regard to the workmen's houses. Mr. Adams, clerk to the Rural District Council, said their contention was that they had only been in office about nine months, and had scarcely had time to carry out the work they considered necessary. Their medical officers supported the order, but these gentlemen did not know the necessities of the various districts so well as those living in the immediate neighbourhood who were opposed to the order. Dr. Hill, in reply, remarked that the object of the County Council in this matter was solely that of the improvement of the sanitary condition of the district, which he considered was not in a satisfactory state.

STAINED GLASS AND DECORATION.

GREATFORD CHURCH, LINCS.—A three-light window in this Parish Church has just been filled with painted glass by Messrs. Percy Bacon Brothers, of Newman-street, London, W., each light containing a single figure of St. John, St. Peter, and St. James respectively, with representations of angels in the tracery. A peculiar feature in this window, is the canopy-work of a very late character to suit the architecture of the window, which is square-headed.

WINDOW, PARISH CHURCH, WREXHAM.—The large west window of this church has recently been embellished with stained glass as a memorial to officers and men of the Royal Welsh Fusiliers who have fallen in divers battles in which the regiment has been engaged. The *Bristol Times* states that it is a fifteenth-century window and is divided into five long lights up to the springing of its arch, above which are ten smaller tracery lights in three tiers. In the upper part of the lower lights are full-size figures of St. Deiniol of Bangor, St. Michael, St. David of Wales, Edward the Black Prince, and St. Giles. Beneath these, in relation to the figures above, are subsidiary subjects illustrative of the meeting of St. Deiniol and St. Augustine; St. Michael with his warrior angels; the preaching of St. David; the Black Prince at the battle of Poictiers; St. Giles with the hind seeking refuge with the saint from the royal hunters. These lights are richly canopied to agree with the style of the window. In the tracery-openings are introduced twenty-four smaller figures of saints especially connected with Wales. At the apex of the window the badge of the regiment is represented. At the base of all, in gold mosaic, runs a suitable dedicatory inscription. The names of the regiment's battles, viz., Blenheim, in Egypt, in the Peninsula, Waterloo, Alma, and Lucknow are also introduced. The work is rich in detail and colour, and was designed and executed by Messrs. Clayton & Bell, of London.

FOREIGN AND COLONIAL.

FRANCE.—Owing to a serious accident which has recently taken place near the Pont de l'Europe, the company of the Chemins de Fer de l'Ouest have decided to pull down the long Batignolles tunnel. This will considerably enlarge the network of railways approaching the Gare Saint Lazare.——In order to do away with the scarcity of water from which Paris so constantly suffers during the hot weather, the Municipality intend to bring the waters of the Loing into the city. There is also a scheme of making a third reservoir at Saint Cloud, of which the expense is estimated at 1,400,000 francs.——Madame Furtado-Heine has given to the French Government a very fine villa, which belongs to her at Nice, and which is to be made into a hospital for officers. M. Scala is the architect who has been entrusted with the work of altering this great house.——A competition of sketches is open, between the architects of Aisne du Nord, Pas-de-Calais, and La Somme, for the rebuilding of the Palace of Fervagnes at St. Quentin. The expense is expected to be about a million francs.——The General Council at Hérault has opened a competition for designs for a lunatic asylum at Montpellier.——An electric railway is to be made at Lyon which will connect the Croix Rousse to the Colline de Fourvière, and will require the construction of a monumental bridge over the Saône. It is estimated that five millions will be spent on this operation.——A fine bridge is being made across the Isère at Fontenex. It is of stone, with four arches, the length will be 115 mètres, and the cost 162,000 francs.——The Minister of Fine Arts is about to restore the Abbey Church at Vienne (Isère), also the Basilicon of Saint Maurice, the portal of which, dating from the fifteenth century, is famous.——The town of Cherbourg has erected a monument of granite with bronze ornaments, in honour of the soldiers and sailors who died during the expeditions to the far East.——The death is announced, at the age of seventy-two, of M. Anatole de Montaiglon, a learned archæologist, professor of the Ecole des Chartes, and author of valuable works on Fine Arts in France.——The death is also announced of M. Henri Joseph Parent, at the age of seventy-six. He was a member of the Société Centrale, and of the Caisse de Défence Mutuelle des Architectes. He has filled a considerable post in private contemporary architecture.——There is a question of making a navigable canal from Berry; it will measure 45 kilomètres, and will cost about thirteen million francs.

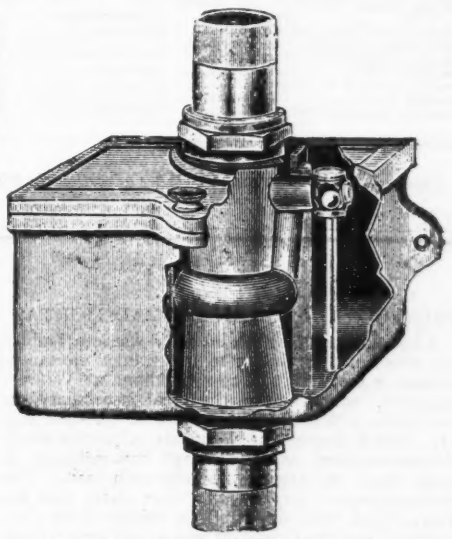
MISCELLANEOUS.

THE LATE MR. EWAN CHRISTIAN.—A monument of simple design and recumbent in form has just been placed over the grave of the late Mr. Ewan Christian, in Hampstead Cemetery. It is executed in red granite by Mr. Forsyth, and bears the following inscription:—"In reverent and loving memory of Ewan Christian, architect. September 20, 1814—February 21, 1895. 'With good will doing service, as to the Lord, and not to man, that I may win Christ, and be found in Him, not having my own righteousness, but that which is through faith in Christ.'"

RECULVER ABBEY.—Will the writer of a letter on this subject, from Sittingbourne, kindly send us a legible signature to which we can reply.

THE LAST OF THE TURNPIKES.—Of all the turnpike trusts with which this country abounded in the last generation, there remains only one in existence. Possibly it will be a surprise to some people to hear that there is even one survivor of such an unpopular system of road government, but it will not be possible to make the assertion a few weeks hence. The Shrewsbury and Holyhead Turnpike has for the most part been already thrown open, but the portion of the road which traverses the Island of Anglesey was continued in existence by a special Act of 1890 until November 1 of the present year. Thirty years ago there were no fewer than 1,047 turnpike trusts in England and Wales, with 20 189 miles of road supported by tolls.—*Local Government Journal.*

AUTOMATIC DISINFECTING-BOX.—Messrs. Gabriel & Co., of Birmingham, send us the illustration of their patent automatic disinfecting-box. It consists of a small iron box, with a brass tube through the centre, attached to which is a small syphon-pipe which has in the top a metal ball to regulate the supply. The box is fixed on the fall-pipe between the cistern and pan, and is filled with any liquid disinfectant. On the flushing cistern being brought into use, the action of the water flowing down the pipe through the box sets up a syphoning action, lifts the ball from its seat in the small syphon,



Gabriel's Automatic Disinfecting Box.

and draws out a small quantity of the liquid, which is carried with the water into the pan. When the flushing-cistern has ceased syphoning, the small ball in the syphon falls by its own weight on its seat, and prevents any more liquid escaping. The lid of the box is made detachable, so that it can be readily removed for filling when required. The box when filled will last two or three weeks, according to the number of times it is used. It seems the most convenient method of automatic disinfection that we have seen.

SAFETY PARAFFIN LAMP.—This lamp, patented by Messrs. Kiesow & Co. (London), is contrived to prevent the escape of oil if accidentally overturned. The reservoir is of metal (it should never be of glass), and the wick is drawn through a tube with an S bend. In case of the lamp being overturned, a portion of the bent tube fills with air and prevents the oil escaping; it acts as an "air-seal" in fact, against the flow of the oil.

A PATENT DOOR-STOP AND CATCH.—Messrs. Marrian & Co., of Birmingham, send us a specimen of what they call "The Anti-slam," a very ingenious and useful combined door-stop and catch. It is in a metal seating, fitted in flush with the floor. Above the seating is a small india-rubber-coated stop, intended to occupy the extreme point to which the door can open, and on the door striking this stop it moves back about half-an-inch, and in doing so automatically raises a steel catch on the other side of the door, which holds the latter open. In the case of doors which have to stand open often there is thus a complete security obtained against the door slamming to, by the mere action of opening it. When it is desired to release the door it is only necessary to touch the stop with the foot, and the catch is drawn down again flush with the floor. It is an ingenious device, and ought to be very useful.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Asylum Extension, Beverley	East Riding Visiting Committee	50*l.* 25*l.* 10*l.*	Oct. 28
*Modern Hotel	Weymouth Corp.	200*l.* 100*l.* and 50*l.*	Dec. 3
Workhouse Wards, Beckett-street	Leeds Union	50*l.* 25*l.* 12*l.* 10*s.*	Jan. 1'96

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Pipe Sewers, &c. Ormskirk	Lathom & Burscough U.D.C.	Wood & Brodie	Oct. 1
Addition to Tannery, Port-road, Carlisle	T. Williamson	T. T. Scott	do.
Boiler House, &c. Copley Mills, Halifax		A. G. Dalzell	do.
Making-up South Park-road and others	Wimbledon U.D.C.	*Official*	do.
Stone Walls, &c. at Cemetery, Broadway	Peterborough Cemetery Commissioners	J. Ruddle	Oct. 2
School, Cefnpennar, Mountain Ash, Glam.	Llanwonno School Bd.	M. Morgan	do.
Additions, &c. to Asylum, Enniscorthy	Lunacy Commissioners (Ireland)	C. A. Owen	do.
Nine Houses, Crossgates, near Leeds		Jno. Brearley	do.
House, Store Buildings, &c. at Sewage Disposal Works, Saltesburn	Blackburn Corp.	G. W. Lund	Oct. 3
Cast-iron Pipes (4,624 tons) and Castings	Belfast Water Com.	L. L. Macassey	do.
Sewering, Kerbing, &c. Lathom-avenue, Seaforth	Waterloo U.D.C.	F. S. Yates	do.
Whinstone and Limestone	Blaydon-on-Tyne U.D.C	W. S. Simpson	do.
Stables and Schoolroom, Glastry	Presbyterian Church Committee	*Official*	do.
Sewering, &c. Egerton-street	Prestwich (Lancs) U.D.C	do.	do.
Drain Pipes	Horsham U.D.C.	do.	do.
*Sundry Repairs, Workhouse, &c.	St. George-in-the-East Guardians	Wilson, Son, & Aldwinckle	Oct. 4
*Foundations for Turntable, Hope	M.R. Co.	*Official*	do.
*Erection of Sixteen Coast Guard Houses	Admiralty Wks. Dept.	do.	do.
Sewers, &c. Vernon-street, Bridlington Quay	Cowton's Charity Trus.	J. Earnshaw	Oct. 5
Additions to Workhouse, West End, Southampton	South Stoneham Union	Mitchell, Son, & Gutteridge	do.
*Steel and Iron for Engineering Works, Rugby	Messrs. Willans & Robinson, Ltd.		do.
Three Shops, Peel-street, &c. Morley, Yorks	J. Taylor & Sons		Oct. 6
Tanks, Press House, Buildings, &c.	Cambridge Corp.	J. T. Wood	Oct. 7
Earthenware Pipe Sewers	Pudsey (Yorks) U.D.C.	Mr. Cass	do.
Brick and Pipe Sewers, Morriston	Swansea Town Council	E. H. Wynill	do.
*Erection of House	Croydon Council	*Official*	do.
*Paving Works at Workhouse	Whitechapel Union	Bruce J. Capell	do.
*Broken Granite	Bermondsey Vestry	F. Sumner	do.
Cast-iron Pipes and Castings	Southampton Corp.	W. Matthews	Oct. 8

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered
House adjoining Docks	Exmouth Dock Co.	J. Johnson	Oct. 8
*Repair of Roads and Road Materials	Croydon Council	W. Powell	do.
*Drain Pipes and Stores	do.	*Official*	do.
Passenger Station, Llangonoyd, Glam.	G. W. R. Co.	do.	do
*Engine Shed, &c. Taunton	do.	do.	do.
*Broken Granite	Edmonton U.D.C.	do.	do.
Baths and Washhouses, Springburn	Glasgow Police Com.	do.	Oct. 9
Additions to Infirmary, Storage Tank, &c. Minster	Sheppey Union	W. L. Grant	do
Additions to Schools, St. Silas', Blackburn		J. Bintley	do.
Whinstone Road Metal, near Newcastle-on-Tyne	Bedlington U.D.C.	M. Cooper	do.
Quay Wall	Poole Town Council	J. Elford	Oct. 10
Road Works	Godalming Corp.	S. Welman	Oct. 12
School, near Rhymney Bridge	Llangynider Sch. Bd.	D. Morgan	do.
*New Buildings at Workhouse	Leigh Union	Mangnall & Littlewood	do.
*Granite Kerbing and Channelling	Barnet U.D.C.	W. H. Mansbridge	do.
*Indurable Slab Paving	do.	do.	do.
Brick and Pipe Sewers	Llandudno U.D.C.	E. P. Stephenson	Oct. 15
Alterations, &c. to Offices, Dormer-place	Leamington Sch. Bd.	M. Foster	do.
*Government Offices, Derby	Com. of H.M. Works	J. Lee & Son	do.
*Alterations to Lavatories, Engine House, &c.	Stepney Union	G. E. Holman	Oct. 17
Fifteen Houses, Pentre Rhondda, Glam.		Jacob Rees	Oct. 21
Slaughter House, &c.	Kirkby-in-Ashfield Co-op. Soc. Ltd.	Ball & Lamb	No date
Sewerage Works, Portland-street	Mansfield Woodhouse U.D.C.	F. Cook	do.
Shops and Houses, My Lady's-road, Belfast	H. Ellis	E. & J. Byrne	do.
Hall, Langley Park, Sutton, Surrey		W. J. A. Souttar	do.
New Road, All Saints' Estate, Maidenhead		H. D. Tilly	do.
Terrace, Fistral-avenue, Newquay, Cornwall		Silvanus Trevail	do.
Additions to Villa, Orleton, near Leominster		W. W. Robinson	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Sittingbourne U.D.C.		Sept. 30
*Assistant Surveyor	Margate Corp.	120*l.*	Oct. 1
*Superintending Architect	Lancashire Standing Joint Committee	600*l.*	Oct. 5
Highway Surveyor	Ludlow R.D.C.	100*l.*	do.
*General Outdoor Assistant	Hove U.D.C.	2*l.* 10*s.* per week	No date
*Clerk of Works	Edgware Sch. Bd.		do.

Those marked with an asterisk (*) are advertised in this Number. Competition, p. iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, pp.* xvi., xvii., *and* xviii.

LEGAL.

PROSECUTION FOR USING BAD MORTAR.

A CASE of considerable interest, where a builder was prosecuted for failing to use proper mortar or cement in erecting some new buildings at Wolverhampton, came before the local stipendiary, on Friday the 20th inst. The builder in question was Mr. Alfred Peploe, of Bellfields, Compton-road, Wolverhampton, and the charge had reference to work done on August 9th and 20th last. The *Wolverhampton Express and Star* states that the Town Clerk, who appeared on behalf of the Corporation, said the defendant was a builder carrying on business at Wolverhampton, and he was charged that on August 9th he did, in erecting new buildings in Dawson-street, not cause the walls enclosing the same to be put up with good mortar or good cement. On the same day he was charged with an offence in respect of the cross walls. There was also an information laid against defendant for doing the same thing on August 20th. He (the Town Clerk) understood that Mr. Foster, who was for the defence, was willing to plead guilty with respect to the offence of August 9. A sample of the mortar taken was submitted to the Borough Analyst, who in his certificate stated that there was a decided trace of copper in the dry sample of sand, &c., and a slight trace in the mortar. The amount of lime was sadly inadequate to form good mortar, being one to seven, instead of about one to three of sand. There were ashes, broken brick, and some lime in another sample, which was absolutely inadequate to bind the materials for mortar. Mr. Foster asked him (the Town Clerk) to withdraw the case in respect of the second offence, and he would be willing to do so on condition that the full costs were paid, but it must be remembered that the offences were of a very serious character, and he was bound to press for a heavy penalty in the case which was admitted.

Mr. Foster, for the defendant, said it was practically one offence. In mitigation of penalty he had to say that defendant had been most anxious to use the best possible materials for the construction of his property. He was not a speculative builder, he was putting up the property for his own use. He was engaged as an insurance agent, and had not been able to devote that attention to the building he would like to have done.

The stipendiary imposed a penalty of 5*l.* and costs in one case, and allowed the others to be withdrawn on payment of costs. Total, 11*l.* 11*s.* 6*d.*

CAPITAL AND LABOUR.

LONDON BRICKLAYERS' DISPUTES.—The crusade on the part of the Operative Bricklayers' Society against the employment of non-union men has been vigorously pursued during the past week. Amongst other things the Society withdrew its men from the works of Messrs. Nightingale, at Orme-street, Bayswater-road. The National Free Labour Association received urgent appeals from the employers to send men to take the place of the strikers, but it was soon found that more men offered themselves than could be employed, and the works consequently proceeded as usual, though the union pickets surrounded the place. We understand that bricklayers are being offered work for the Association at the recognised trade union rate of wages. The Operative Bricklayers' Society had previously called out men from Messrs. Mowlem & Co.'s at Oak Wharf, City-road. Considerable misunderstanding arose as to the policy of the London Building Trades' Federation with reference to the strikes. It was hoped by the Operative Bricklayers' Society that the Federation would support them, but subsequent events did not altogether confirm this impression, though so many different versions of the disputes have been given that it is hard to know what to believe.

MEETINGS.

SATURDAY, SEPTEMBER 28.

Architectural Association.—Visit to Wickham Hall. Leave Cannon-street Station 2.18 p.m.

TUESDAY, OCTOBER 1.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. Herbert Manley on "Sanitary Law." 8 p.m.

Glasgow Architectural Association.—Mr. A. M'Gibbon on "Materials." 8 p.m.—Visit to Glasgow Art Galleries, Kelvingrove.

WEDNESDAY, OCTOBER 2.

Sanitary Institute.—Inspection and Demonstration of Stone-yard and Disinfecting Station, Marylebone. 3 p.m.

Builders' Foremen and Clerks of Works' Association.—Ordinary Meeting. 8 p.m.

FRIDAY, OCTOBER 4.

Institution of Junior Engineers. — Annual General Meeting, Westminster Palace Hotel. 8 p.m.

SATURDAY, OCTOBER 5.

Sanitary Institute.—Inspection of Wimbledon Sewage Works, conducted by Mr. C. H. Cooper. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

16,585.—SET SQUARES: *J. Hughes.*—A set-square (60 deg.) having its edges divided into different scales of inches, and geometrical figures described upon its faces.

19,325.—FIREPROOF FLOORS: *T. Mossman.*—Refers to the lintels for fire-proof floors or roofs, such lintels being constructed of hollow fire-clay, and of a suitable shape for forming dovetail cavities for receiving the concrete covering, and also fitting into each other longitudinally for mutual support.

19,374.—SAWS: *W. Plested.*—Provides an easier method of sharpening saws. A helical thread, or worm of steel, stone, or other suitable material having a rough or file-cut edge, is arranged in a suitable frame, and by means of an axle and mitre-wheels is made to travel or rotate between the teeth of the saw.

19,711.—KILNS: *B. Dawson.*—Refers to kilns for pottery, bricks, and the like. For supplying hot air to any one or more of the kilns at starting, a pair of air regenerators are arranged on the outside in connexion with which are a pair of reversing valves. The regenerators are heated by gas at the start, and afterwards by utilising a portion of the heat of the products of combustion escaping from the kiln.

300.—GATE-HOLDER: *J. Cotter.*—A device for holding open gates or doors. A hook is attached to the door or gate, and when in use engages with a hole formed in a hinged spring actuated plate.

10,944.—SKYLIGHTS: *K. Hurtgen.*—Relates to a skylight which will admit air, but will be weather-proof in other respects. Several roof-shaped frames are hung on to a movable skylight frame, containing the window-pane, in snch a manner that, on the window being opened, gaps, for the admission of air, are formed between the frames.

13,442.—VAULTS: *C. Voltz.*—Deals with the manufacture of fireproof vaults, walls, ceilings, &c., and consists in applying to a temporary erected boarding, a pulpy mixture formed of cinders, gypsum, lime, and glue, to which is afterwards added another layer of vegetable fibre, dipped in a mixture of gypsum and glue, for the purpose of obtaining a quick-hardening strong mass. A third layer, similar to the first, may be added.

13,631.—DOOR CHECKS: *E. Blount.*—A contrivance for automatically closing doors without slamming. Consists essentially of a casing having a liquid space, a piston and cylinder, and a bye-pass from the liquid space to the outer portion of the cylinder, with a valve for controlling the movement of the liquid.

13,667.—ROOFING TILES: *P. Burns.*—In this invention each tile consists of two plates of rhomboidal shape, arranged to overlap, and provided along the sides with grooves and ribs fitting each other, or simply with a flange projection at the top and bottom of each plate respectively.

NEW APPLICATIONS FOR LETTERS PATENT.

SEPTEMBER 9.—16,802, W. Coke, Ribbed Stoneware, Earthenware, Concrete, and other Sanitary Pipes.—16,824, W. Chivers, Window-sash Adjuster.—16,829, T. Lewis,

Paving and Flooring Block.—16,844, F. Demolder, Preventing the Formation of Ice in Water-pipes.

SEPTEMBER 10.—16,867, J. Templeton and H. Robinson, Testing Gas and Water-pipes or Fittings.—16,880, F. Bates, Stench Trap.—16,883, T. Trussell, Surveying Chain.—16,919, E. Thomas, Devices for Cleaning Buildings.

SEPTEMBER 11.—16,962, A. Patrick, Manufacture of Finely-pulverised Substances used in the Manufacture of Portland Cement, Pigments, &c.—16,965, G. Parkes, Auger.—16,975, T. Westley, Draught Excluders for Doors.—16,981, W. Gabriel, Spring Tower or Barrel Bolt.—16,983, A. Hiscock, Water-taps and Valves.—16,999, T. Brennan, Window-sashes and Frames.

SEPTEMBER 12.—17,054, G. Bellamy and others, Bricks or Blocks for Building and Paving.

SEPTEMBER 13.—17,131, W. Harrison, Cowls.—17,136, L. Hérard, Artificial Mosaic.—17,137, C. Turnock, Sawing Machines.

SEPTEMBER 14.—17,149, A. Brandon and S. Greenfield, Bolts for Street-doors, &c.—17,154, T. Downie, Window-sashes.—17,155, A. Thom, Window-sashes whereby they can be adapted to Ventilate Rooms, Halls, &c.—17,172, F. Stephens, Window-sash Fasteners.—17,173, A. Shaw, Lavatory Basins.—17,191, W. Davison, Device for Use in Connexion with Ladders, &c., for Supporting Planks or Staging.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14,126, D. Hilton, Metal Laths.—14,259, R. Freeman and T. Rackliff, Woodworker's Bench-Stop Adjuster.—14,567, J. Whelan, Controlling the Admission of Water to Cisterns or Tanks.—14,621, O. Launch, Facing or Covering of Walls.—14,763, E. Francis and G. Francis, Safety Device for Use with Windows.—14,790, P. Stuart, Blocks for Paving, &c.—14,967, A. Wilson, Windows.—14,969, W. Treseder, Wood-screws.—14,976, A. Berkel and H. Tipping, Artificial Wood and Stone for Building and other purposes.—14,979, H. Coombs, Water Waste-preventer, &c.—15,001, A. MacIver, Windows.—15,019, R. Taylor and D. Moseley, Side-guards for Doors.—15,052, G. Wynne, Ladder Rungs.—15,071, T. Hall, Mason and Builders' Scaffolding.—15,139, J. Brindley, Ceramic Tiles.—15,256, G. Anderson, Sash-frames of Windows.—15,385, F. Gibbons, Fanlight-openers.—15,488, R. Strong, Production of Artificial Marble, &c.—15,614, W. Mills, Holding Window-sash Frames, &c.—15,619, J. Hampton, jun., Mitre-cutter and Corner Cramp combined.—15,782, P. Purcell, Doors, Windows, &c.—15,949, E. Wynne, Self Counter-sinking Screws for use in Wood, &c.—16,007, T. Ford, Chandeliers, &c.—16,144. J. Oldfield, Water Waste-Preventers.—16,177, A. Mitchell, Door-knobs.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

17,238, J. Spear, Apparatus for Stopping the Inrush of Water to Water-closet Tanks.—21,275, J. Vercoe, Sewers.—21,876, J. Whitehead, Fastening Windows, &c.—15,773, H. Ostermann, Stoves.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 0/0/0
Teak, E.I.	load	10/0/0 16/0/0
Sequoia, U.S. ft. cu		1/7 1/10
Ash, Canada load		3/0/0 4/5/0
Birch, do.		2/0/0 3/5/0
Elm, do.		3/15/0 5/0/0
Fir, Dantsic, &c.		2/0/0 3/10/0
Oak, do.		2/15/0 4/15/0
Canada		6/5/0 7/15/0
Pine, Canada red		0/0/0 0/0/0
Do. Yellow		2/10/0 4/15/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg		5/0/0 6/10/0
Wainscot, Riga, &c., log		2/15/0 5/0/0
Odessa, crown		2/15/0 5/0/0
Deals, Finland 2nd & 1st std 100		7/0/0 8/10/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		7/0/0 8/0/0
St. Petersburg, 1st yellow		9/10/0 12/0/0
Do. 2nd yellow		7/10/0 9/0/0
Do. white		8/0/0 9/10/0
Swedish		7/0/0 15/10/0
White Sea		7/5/0 14/0/0
Canada, Pine 1st		21/0/0 24/0/0
Do. do. 2nd		16/0/0 17/0/0
Do. do. 3rd, &c.		8/0/0 10/0/0
Do. Spruce, 1st		9/0/0 10/10/0
Do. do. 3rd and 2nd		6/10/0 7/10/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 21/0/0
Flooring boards, sq., 1 in. prep. 1st		0/9/6 0/14/6
Do. 2nd		0/6/6 0/11/6
Other qualities—		0/4/6 0/7/6
Cedar, Cuba ..ft.		/3 /4
Honduras, &c.		/3 /4½
Mahogany, Cuba		/3 /6
St. Domingo, cargo av.		/3 1/0
Mexican do. do.		/3 /4
Tobasco do. do.		/3½ /6
Honduras do.		/3½ /5½
Box, Turkey ton		4/0/0 15/0/0
Rose, Rio		7/0/0 16/0/0
Bahia		6/0/0 15/0/0
Satin, St. Domingo		0/0/5 0/1/0

TIMBER (*continued*).		
Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian	0/0/3	0/0/7

METALS.		
Iron—Pig, in Scotland ton	2/7/2½	0/0/0
Bar, Welsh, in London	5/12/6	5/15/0
Do. do. at works in Wales	5/2/6	5/5/0
Do. Staffordshire, in London	6/0/0	6/10/0
COPPER—British cake and ingot	50/0/0	50/10/0
Best selected	51/0/0	51/5/0
Sheets, strong	57/0/0	0/0/0
Chili bars	46/10/0	46/15/0
YELLOW M'TAL	0/0 4-16	0/0 4⅜
LEAD—Pig, Spanish ton	10/17/6	0/0/0
English com. brands	11/0/0	0/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards	12/0/0	12/2/6
Pipe	12/10/0	0/0/0
ZINC—English sheet ton	18/5/0	18/10/0
Vieille Montagne	18/15/0	0/0/0
TIN—Straits	64/17/6	65/7/6
Australian	66/17/6	67/17/6
English Ingots	67/15/0	68/0/0
Banca	66/10/0	67/0/0
Billiton	65/5/0	65/15/0

OILS.		
Linseed ton	20/5/0	20/15/0
Cocoanut, Cochin	24/0/0	0/0/0
Do. Ceylon	23/0/0	0/0/0
Palm, Lagos	23/0/0	0/0/0
Rapeseed, English pale	22/0/0	0/0/0
Do. brown	20/10/0	20/15/0
Cottonseed ref.	17/5/0	17/15/0
Oleine	20/10/0	21/10/0
Lubricating, U.S.	5/6/0	8/0/0
Do. black	4/9/0	6/6/3
TAR—Stockholm barrel	0/19/6	0/0/0
Archangel	0/14/6	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

ABERDEEN.—For causewaying Commerce-lane, for the Town Council. Mr. Wm. Dyack, Borough Surveyor, Town House, Aberdeen:—
Rodk. McKay, Abergeldie-road.... 6s. 7½d. per super. yard.

AMBLE (Northumberland).—For the supply of 1,200 tons road-metal, for the Urban District Council. Mr. W. Gibson, Town Surveyor, Council Chambers, 31, Queen-street, Amble:—
Northumberland Whinstone Co., Ltd., Newcastle-on-Tyne, 7s. 4d. per ton, broken 2-in. ring.

AMPFIELD (Hants.).—For alterations, &c., to the vicarage house. Mr. A. R. Barker, architect:—

G. Wheeler & Sons	£472 0	Goulding & Son	£375 0
W. P. Moreton	471 0	C. Grace & Sons	345 18
A. Targett	449 0		

ASPATRIA (Cumberland).—Accepted for the erection of a Primitive Methodist Chapel, for the Trustees. Mr. W. G. Scott, architect, Victoria Buildings, Workington:—

Masonry.—M. Wilson, Workington	£499 0 0
Joinery.—J. Fletcher, Workington	294 10 0
Slating.—J. T. Kellet, Carlisle	56 10 0
Plastering.—G. Nicholson, Wigton	44 15 0
Plumbing.—Wm. Strathern, Whitehaven	46 2 6
Glazing.—Wm. Strathern, Whitehaven	36 15 0
Painting.—J. Gordon, Maryport	14 0 0
	991 12 6

ATHERSTONE.—For the erection of school buildings, Hurley, for the Kingsbury School Board. Messrs. Newton & Cheatle, architects, 121, Colmore-row, Birmingham:—

Walton & Son	£2,494 19 5	Stafford & Mansfield	£2,215 0 0
Lane Bros.	2,450 0 0	Smith & Pitts	2,197 0 0
Green	2,330 0 0	Slater & Harrison, Overseale, Ashby*	2,024 16 0
Charles	2,297 0 0	Musson	1,950 0 0
Ford	2,290 0 0		

* Accepted.

BRENTFORD.—For the supply of broken granite for the Urban District Council. Mr. Nowell Parr, surveyor, Clifden House, Boston-road, Brentford:—

Granite.

	Per yard cubic. s. d.		Per yard cubic. s. d.
Manuelle & Co.	14 8	H. Covington	12 6
W. Griffith	15 3	Mowlem & Co., Grosvenor Wharf*	13 11
Fennings	15 4		
Le Maitre	13 0		

* Accepted.

BRIDLINGTON QUAY (Yorks.).—For the erection of semi detached villas, &c., Trinity-road, for Mr. W. Day. Mr. J. Earnshaw, architect, Wellington-road, Bridlington Quay:—

J. H. Hudson	£1,287
R. Bailey, Bridlington Quay (accepted)	1,260

BRIGHTON.—For the extension of colonnade and terrace Madeira-road. Mr. F. J. C. May, C.E., Town Hall, Brighton.

V. P. Freeman	£11,027 0 0	B. Cooke & Co.	£10,700 0 0
G. Double	11,831 0 0	Goddard, Massey & Warner	10,000 0 0
Reed & Son	11,750 0 0	J. Longley & Co., Crawley*	9,899 0 0
Parsons & Sons	11,001 0 0		
P. Peters & Son	10,850 0 0		
W. A. Field & Co.	10,739 0 0		

* Accepted.

BURSLEDON (Hants.).—For alterations to rectory house. Mr. A. R. Barker, architect:—

Brinton & Bone	£905	W. H. Chapman	£183
C. Barter	197		

CHALTON (Hants.).—For alterations and additions to rectory house. Mr. A. R. Barker, architect:—

W. Read	£650	J. Croad	£490
W. Hedjcock	550	J. Edney	470

CHILBOLTON (Hants.).—For alterations to rectory house. Mr. A. R. Barker, architect:—

C. Grace	£130 0	G. Heaven	£102 15
A. Spratt.	105 0		

COMPTON GIFFORD (Devon.).—For widening Higher Compton-road, for the Urban District Council. Mr. R. Hansford Worth, surveyor, 42, George-street, Plymouth:—

J. Shaddock	£380 16 10	E. Duke	£310 7 10
T. Shaddock	371 0 0	Paynter & Davy, Plymouth*	299 15 2
W. C. Shaddock	334 16 11		

* Accepted.

COOKHAM (Berks.).—For alterations and additions to "Riverdene," for Mr. Charles Saxton. Mr. Arthur Vernon, architect, 29, Cockspur-street, S.W.:—

Colls	£1,110	Gibson (accepted)	£580
Silver	597		

CROYDON.—For alterations, &c., to No. 96, George-street, Croydon, for Messrs. T. S. & C. Parry. Mr. Robt. M. Chart, architect, Union Bank-chambers, Croydon:—

Smith & Sons	£237 0 0	Umlandt & Nicholl	£198 10 0
E. Goulder	216 0 0	D. Waller, junr.	191 10 0

[All of Croydon.]

FELIXSTOWE.—For the execution of drainage works (Contract No. 3) for the Corporation. Mr. Geo. S. Horton, Engineer, Townhall, Felixstowe:—

George Double, Ipswich*	£4,180 11 10

* Eight firms tendered; this amount was lowest.

FIFE (N.B.).—For the construction of a water storage pond (3½ acres), for the Guard Bridge Paper Co., Ltd. Messrs. Buchanan & Bennett, C.E., 24, George-street, Edinburgh:—

D. Shanks	£4,801 11 0	R. C. Brebner	£3,675 4 11
W. & D. Horsburgh	4,513 4 0	D. Waddell	3,670 10 6
J. & C. Hay	4,177 1 0	A. Bremner	3,646 0 11
D. Messer & Co.	4,137 2 9	J. McKnight & Son	3,619 11 1
J. Watson	4,123 7 2	P. Girrity	3,608 7 0
W. Simpson	4,073 14 0	G. Mackay & Son	3,554 11 2
T. Peattie	3,907 7 2	P. Bow	3,458 16 2
J. Mackay	3,893 9 5	D. Black	3,234 3 0
J. Croft	3,852 4 2	J. & J. Stevens	3,146 9 4½
D. Gilmour	3,834 17 9½	R. Suttie	2,970 15 5
R. Gilmour	3,753 7 1		

FOLKESTONE.—For additions, &c. (new chancel and north aisle), to St. John's Church. Mr. A. R. Barker, architect:—

R. Webster	£4,000 0	G. E. Walles & Sons	£3,432 0
Dove Bros.	3,695 0	E. Padget	3,355 4
J. O. Petts & Son	3,621 0	T. L. Fearon	3,276 0
L. H. & R. Roberts	3,589 0	Hayward & Paramor	3,236 10
W. Johnson & Co.	3,573 0		

GRAYS (Essex).—For the supply of 200 tons broken granite and 800 tons Kentish rag, &c., for the Orsett Rural District Council. Mr. W. F. G. Brumell, surveyor, Stanford-le-Hope:—

Granite.—Enderby & Stoney Stanton Granite Co.	£0 12 6*
Kentish Rag.—Hy. Wright & Son, Maidstone	0 9 0†
Kentish Flints.—Hy. Wright & Son, Maidstone	0 5 0†

* Per ton, in trucks at Purfleet, N. and S. Ockendon, and Grays.
† Per yard, in barges at Purfleet, Grays, Mucking, Fobbing, and Stanford-le-Hope.

HARRINGTON (Cumberland).—Accepted for the erection of school buildings, for the School Board. Mr. W. G. Scott, architect, Victoria-buildings, Workington:—

Masonry.—H. Killip, Harrington	£1,075 0 0
Joinery.—Jas. Fletcher, Workington	537 0 0
Slating.—J. B. Whitfield, Workington	191 15 0
Plumbing.—Wm. Strathern, Whitehaven	218 1 7
Plastering.—J. Lawson, Workington	361 14 5
Painting and Glazing.—T. D. Kunliside, Workington	69 10 0
	£2,453 1 0

HEREFORD.—Accepted for the erection of coach-house and stables, Hampton Park, for Mr. Thomas. Mr. Ernest G. Davies, architect, St. John-street, Hereford:—

Wm. Rowberry	£210

HEREFORD.—For the erection of a villa residence in Ryeland-street. Mr. Ernest G. Davies, architect, St. John-street, Hereford:—

Jos. Mason	£650

HOVE (Sussex).—Accepted for the execution of paving works, Blatchington-road, and four other streets, for the Urban District Council. Mr. H. H. Scott, Town Surveyor, Town Hall, Hove:—

J. Parsons & Sons, Hove	£2,241

ILFORD.—For the supply of 1,300 tons broken Guernsey granite, for the Urban District Council. Mr. T. B. Baldwin, Road Surveyor, District Council Offices, Ilford:—

	Per Ton. s. d.		Per Ton. s. d.
G. Rutty	13 6	L. Sommerfeld	12 7
Mosslem	13 2	W. Muir & Co.	12 3
R. L. & J. Fennings	13 0	Wm. Griffiths*	12 3
Wm. Gibbs	12 11		

* Accepted.

LEEK (Staffs.).—For making a new road, at Basford Hurst, for Mr. W. H. Rider. Messrs. W. Sugden & Son, surveyors, Leek and Hanley. Quantities by the surveyors:—

C. R. Plant	£345 3 6	Thomas Grace	£225 0 0
Jas. Clawes & Son	303 0 0	F. Barke, Stoke*	276 0 0
Jas. Stansfield	229 0 0		

* Accepted.

LEWES.—For the supply of 450 tons of granite, &c., for the Town Council. Borough Surveyor, Town Hall, Lewes:—

	s. d.		Granite. s. d.	Screenings. s. d.
Berry & Bussey, Lewes*	7 9	Broken Flints.		
Wm. Hudson	7 0	Unbroken Flints.		
R. Brown	8 6	Broken Flints.		
Sommerfeld			12 0	10 0
R. L. & J. Fennings			14 0	11 0
Kent Road Maintenance Co.			11 10	9 10
A. & F. Manuelle			13 2	10 2
Wm. Griffiths			13 8	10 4
Jno. Mowlem & Co., Westminster*			11 1	8 7

* Accepted.

LONDON.—For re-instating damage by fire to the workhouse, Fulham Palace-road, Hammersmith, and other works, for the Guardians of Fulham Union. Mr. A. Saxon Snell, architect:—

E. B. Smith	£771 15 6	H. Wall & Co.	£442 0 0
J. Cox	518 12 0	W. Marks, Walham Green (accepted)	407 14 0
T. Bendon	459 0 0		
J. J. White	456 0 0		

LONDON.—For re-building the laundry and wash-house, erecting temporary laundry, workshops, paving yards, and other works, at the St. Luke's workhouse, City-road, E.C., for the Guardians of Holborn Union. Mr. A. Saxon Snell, architect:—

	Washhouses, &c. £	Temporary do. £
Lorden & Sons	8,800	185
C. Wall	8,475	160
H. Wall & Co.	8,176	174
G. Neal	7,995	198
Gregory & Son	7,787	177
W. Reason, Clerkenwell*	7,149	150

* Accepted.

LONDON.—For alterations and additions to the Hebrew Christian Schools, Streatham Common, for the London Society for Promoting Christianity among the Jews. Mr. Charles C. Bradley, architect, 37, Old Queen-street, Westminster. Quantities by Mr. John B. Lofting, surveyor, 37, Old Queen-street, Westminster:—

S. Page	£3,169	J. Longley & Co.	£2,049
F. G. Minter	3,066	W. Winburn	2,881
W. Mason	2,995		

LONDON.—For painting, cleaning, and various alterations at the infirmary, Havil-street, for the Camberwell Union Guardians:—

J. P. Groom	£1,900	E. C. Bassington	£683
H. G. Bartlett	1,326	Simpson & Cove	649
W. Scott	1,250	Schleckelman	640
J. Wilson	1,227	Alderidge Bros.	590
A. J. Hooking	937	Essex & Co.	553
W. Thorn	812	Bassett & Power	547
H. E. Evans	798	J. Parsons*	539
Stewart & Co.	795	W. Dudley	523
Evans Bros.	723	F. Dawes	520
E. Mill	687	Tiseman & Sons	420

* Accepted.

LONDON.—For the erection of a jetty at Blackwall, for the Receiver for the Metropolitan Police District. Mr. John Butler, architect. Quantities by Mr. W. H. Thurgood:—

Grover & Son	£1,250 0 0	Holloway Bros	£996 0 0
J. O. Richardson	1,045 0 0	T. Docwra & Son	982 5 4
Higgs & Hill	999 0 0	S. Chafen	962 0 0

LONDON.—For the erection of Baptist Church and Schools, Woolwich Lower-road. Mr. George Baines, architect, 4, Great Winchester-street, E.C.:—

	Estimate A.	Estimate B.	Estimate C.	Total.	D.
Scotney & Wootten	£4,209 0 0	£648 0 0	£254 0 0	£5,209 0 0	£85 deduct.
F. J. Gorham	3,901 1 7	754 2 2	254 4 1	4,909 7 10	20 ,,
Balaam Bros.	3,664 0 0	660 0 0	251 0 0	4,575 0 0	75 ,,
W. Shurmar	3,545 0 0	598 0 0	240 0 0	4,383 0 0	123 ,,
T. D. Leng	3,495 0 0	642 0 0	234 0 0	4,371 0 0	20 ,,
J. Bowyer & Co.	3,535 0 0	599 0 0	236 0 0	4,370 0 0	280 ,,
R. A. Lowe	3,473 0 0	613 0 0	242 0 0	4,328 0 0	45 ,,
H. L. Holloway	3,424 0 0	620 0 0	250 0 0	4,294 0 0	75 ,,
T. White & Sons	3,400 0 0	551 12 7	278 14 2	4,230 6 9	113 ,,
Chas. Slow	3,436 0 0	525 0 0	233 10 0	4,194 10 0	75 ,,
B. E. Nightingale	3,378 0 0	567 0 0	249 0 0	4,194 0 0	50 add.
S. J. Scott	3,330 0 0	613 0 0	241 0 0	4,174 0 0	50 ,,
Jerrard & Sons	3,299 0 0	567 0 0	227 0 0	4,093 0 0	38 deduct.
Edward Proctor	3,320 19 10	498 0 2	233 0 0	4,082 2 6	85 ,,
Battley, Sons, & Holness	3,247 0 0	547 0 0	230 0 0	4,024 0 0	30 ,,
Lilly & Lilly, Ltd.	3,232 0 0	538 0 0	227 0 0	3,997 0 0	50 ,,
West Bros.	3,150 0 0	566 0 0	240 0 0	3,956 0 0	40 ,,
Thos. Barden, Maidstone (accepted)	3,170 0 0	550 0 0	214 0 0	3,955 7 0	41 ,,

Estimates A.—Church and vestries. B.—Galleries and staircases C—Boundary walls gates and railings. D.—Difference for Bath stone dressings in lieu of terra-cotta.

LONDON.—For alterations and additions to house and stables, No. 18, Gloucester-square, W. Messrs. Mullett, Booker & Co., surveyors :—

Garlick & Horton	£2,686	H. C. Clifton	£2,283
J. T. Chappell	2,315	Kinnimont & Sons*	2,198

* Accepted.

LONDON.—For alterations to "Red Lion" public-house, Childs' Hill. Mr. A. R. Barker, architect :—

F. Buck	£569 0	Cowley & Drake	£544 10
H. B. Oldrey & Sons	563 0	G. Wheeler	539 10

LONDON.—For re-building "The George" hotel, East Finchley. Mr. A. R. Barker, architect :—

Wheeler & Peake	£3,700	F. Voller	£3,558
G. Godson & Sons	3,630	Brown & Sweetland	3,467
W. Wheeler	3,589	Mattock Bros.	3,430
Macfarlane Bros.	3,587		

LONDON.—For the completion of a stand at the Palliser-road entrance, West Kensington, for the Queen's Club, Ltd. Mr. Alexander Payne, architect, Norfolk House, Victoria Embankment, W.C. :—

Zincwork.

Fredk. Braby & Co.	£207 8 4	Ewart & Son*	£145 19 7

Terra-cotta and Main Front.

	Grey.	Buff.
S. H. Leach	£392 0	£311 15
The Burmantofts Works	280 0	*280 0

General Work.

John Allen & Sons	£1,794	William Longmire & Co.	£1,353
Higgs & Hill	1,449	Gregory & Co.	1,345
Thomas Boyce	1,401	Holloway Bros.	1,324
Thomas Bendon	1,382	Hall, Beddall, & Co.*	1,290
Perry & Co.	1,372		

* Accepted.

LONDON.—Accepted for reinstating premises after fire at 34, Farringdon-road. Mr. Rowland Plumbe, architect :—
F. C. Hoskins, Westminster £3,637

LONDON.—For the erection of board-room and offices, caretaker's premises and stores, and additional places for about 550 children, at the Priory Board Schools, Acton, for the School Board. Edward Monson, architect, Acton Vale, W. Quantities by F. T. W. Miller, of 10, Delahay-street, Westminster, S.W. :—

G. Lyford	£8,700	Thos Nye	£8,100
Wilkinson Bros.	8,470	Foord & Son	7,855
Pattinson & Sons	8,330	G Hooper, Acton, W.*	7,600
Lascelles & Co.	8 205	J. Parsons	7,350
Godson & Son	8,125		

[Architect's estimate, £7,700.]
* Accepted subject to approval of the Education Department.

MAIDSTONE.—For additions to the infirmary at workhouse, for the Union Guardians. Messrs. Ruck & Smith, architects, Maidstone :—

Mayriss	£377 0	Barden	£340 0
Avard	375 0	H. J. Smith	339 0
Burrows	358 15	Wood & Sons	323 0
Wallis & Sons	347 0		

MANCHESTER.—For the erection of stable, &c., Empress-street, Cornbrook, for the Stretford Urban District Council. Mr. John Bowden, architect, 14, Ridgefield, Manchester :—

James Byrom	£1,991 0 0	J. & J. Lee	£1,819 14 1
Herbert Smith	1,965 14 0	Wm. Thorpe, Cornbrook*	1,684 0 0
James Hamilton	1 930 0 0	A. & H. Hulse	1,678 0 0
John Hughes	1,898 0 0		
Pickthall & Pickthall	1,863 0 0		

* Accepted.

MARLBOROUGH (WILTS).—For the erection of an isolation hospital, fence, &c., for the Rural District Council. Mr. H. Hillier, Marlborough :—

	Buildings, &c.	Fence. A	Fence. B
	£ s.	£ s. d.	£ s. d.
H. Hoskings	1,443 0	120 0 0	115 0 0
G. H. Wheeler	1,366 0	—	—
W. E. Piper	1,379 10	187 4 7	171 4 7
B. Hillier, Marlborough*	1,247 0	184 0 0	158 0 0

* Accepted.

MARTLEY (Worcester).—For the execution of drainage works at the workhouse, for the Union Guardians. Mr. Lewis Sheppard, architect, Sansome-walk, Worcester :—
A. Cooper, Smethwick £321 15
[Lowest of four tenders.]

MEONSTOKE (Hants.).—For re-building rectory house and outbuildings. Mr. A. R. Barker, architect :—

Musselwhite & Son	£1,993 0	W. Read	£1,705 0
J. Croad	1,800 0	W. Green	1,379 0
C. Grace	1,773 15		

NELSON (Lancs.).—For the execution of paving works, Carr-road and two other streets, for the Corporation. Mr. B. Ball, C.E., Borough Surveyor, Town-hall, Nelson. Quantities by the Borough Surveyor :—
Joseph Wadge, Burnley £1,503 10 11

NOTTINGHAM.—For the erection of Roman Catholic school buildings, Woodborough-road, for the Rev. E. Wyke. Mr. J. Hart, architect, Corby, Grantham :—

Thomas Bow	£1,206	A. B. Clarke, Nottingham*	£1,018

* Accepted.

NUNEATON.—For additions to National Schools at Stockingford. Messrs. J. R. Veall & Son, architects, Wolverhampton :—

S. B. Woodward	£648 10 0	J. T. Stanyon	£455 11 3
H. Gough	618 11 0	Joshua Wilson, Nuneaton*	448 0 0
Thos. Smith	570 0 0		
C. W. Streater	455 0 0		

* Accepted.

PAIGNTON (Devon).—For the erection of walls and invert to stream and formation of footpaths in the public park for the Urban District Council. Mr. J. Stansfield-Bruce, C.E., Surveyor to the Council. Quantities by Mr. Vincent Cattermole Brown :—
M. Bridgman ..... £826 | R. Harris (accepted) £789

SHIRLEY (Hants).—Accepted for the supply of 400 tons broken granite, for the Urban District Council. Mr. E. J. Batten, Surveyor, Council Offices, Shirley :—
Sandell Bros., Southampton, 10s. 6d. per ton Guernsey granite.

For tar-paving west side of Shirley-road, about 2,000 yards super.

	s. d.
Hobman	2 2 per yard super.
Bradshaw	1 9 " " "
Bradshaw, Southsea*	1 9 " " "

For 12,200 yards rim of kerbing and channelling, and 20,600 yards regulate and make-up gravel footway.

Crook & Batten ..... £1,418 3 7 | Osman* £1,394 0 0
[Both of Southampton.]
* Accepted.

SOUTHEND-ON-SEA.—For levelling, paving, kerbing, &c., Clifton-mews and Pleasant-road, for the Corporation. Mr. H. Harlock, Borough Surveyor, Clarence-road, Southend :—

	Pleasant-road.	Clifton-mews.
T. Adams	£363 16 0	£132 6 5
W. Buxton	336 0 7	159 11 5
W. Wadey, 57, Pellerin-road, Stoke Newington	311 0 0	137 13 11*
E. Iles	309 0 0	138 0 0
W. Griffiths, 283, Kingsland-road	272 0 0*	175 0 0

* Accepted.

SOUTHGATE (Middx.).—For the erection of a school for infants. Mr. A. R. Barker, architect :—

S. Goodall	£1,598 0	L. & W. H. Patman	£1,428 0
A. Monk	1,589 0	C. Newby	1,413 15
Brown & Sweetland	1,539 0	Mattock Bros.	1,361 0
F. Voller	1,455 0	A. Fairhead	1,338 0
J. Groves	1,443 0		

STOKE PRIOR (Herefordshire).—Accepted for additions and alterations to schools, for the School Board. Mr. Ernest G. Davies architect, St. John-street, Hereford :—
J. Watkins, Leominster £220

STRABANE (Ireland).—For re-building stone premises. Mr. Wm. Barker, architect, 25, Orchard-street, Londonderry :—
McCosker & McCaffrey, Lifford £125

STRATFORD-ON-AVON.—For the construction of concrete reservoir, &c. (Contracts 2 and 3), for the Waterworks Committee of the Corporation. Mr. Thos. Rowland, C.E., Stratford-on-Avon. Quantities by the Engineer :—

Vale	£2,905 0 0	Jenkins	£1,216 13 9
Evans	2,165 15 0	Biggs	1,208 0 0
Hindley	1,426 10 0	W. H. Drake & Co., London (accepted)	1,184 9 0
Jones	1,424 18 6		

[Engineer's estimate, £1,340 8s. 5d.]

SWINDON.—Accepted for the execution of street works, Granville-street and others, for the New Town Urban District Council. Mr. H. J. Hamp, surveyor, Regent-circus, Swindon :—

Granville-street.—Free & Sons	£194 12 0
Davis-street.—Free & Sons	197 10 0
Newhall-street.—Free & Sons	205 0 0
Morley-street (part of).—B. Winchcombe	53 15 0
Dowling-street.—B. Winchcombe	193 13 6
Edmund-street.—Free & Sons	243 0 0
Poulton-street (part of).—Free & Sons	145 0 0
Whitney-street.—Free & Sons	245 0 0

TORRINGTON (Devon).—For the construction of filter-beds, service-reservoir, &c., for the Torrington Water Company, Limited. Mr. W. C. Medland, surveyor, Torrington :—

	If brick walls with puddle.	If cement concrete walls.
	£ s. d.	£ s. d.
Gardner & Happerfield	973 18 9	895 7 3
R. Facey	810 5 8	862 6 7
H. Pearce	776 4 11	736 4 11
W. Gibson	700 0 0	725 0 0
H. Grant, Torrington*	679 5 6	599 2 0

* Accepted.

WOLSINGHAM.—For the construction of a bridge over River Derwent, for the Joint Committee of the Lanchester District Highway Board, and Blaydon Urban District Council. Mr. W. Fowls, C.E., Wolsingham, near Darlington. Quantities by the Engineer :—

The Cleveland Bridge and Engineering Co., Ltd.	£2 307 19 6
Darlington Wagon and Engineering Co., Ltd.	2,035 0 0
T. Hilton	1,890 0 0

LONDON.—For the erection of two two-story wards and workshops at the South-Eastern Hospital, for the Metropolitan Asylums Board. The list of tenders for this in our last issue appears to have been incorrect as sent to us, and represented Messrs. Kirk & Randall as having sent the lowest tender (£19,720), which, nevertheless, was not accepted. Messrs. Kirk & Randall inform us that their tender for that amount was for erecting the two wards simultaneously, whereas the Board decided to erect them separately, and accepted the lowest tender for that manner of erection, which was not Messrs. Kirk & Randall's. The two lowest tenders for separate erection were :—
Kirk & Randall ..... £19,920 | W. Johnson & Co. £19,870

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THE INDEX, with TITLE-PAGE, for Volume LXVIII. (Jan. to June, 1895) was given as a supplement with the number for July 13.

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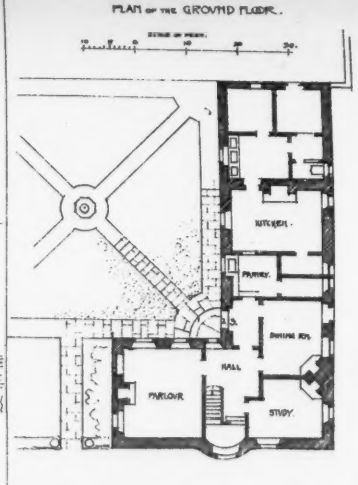
VIEW FROM THE NORTH WEST.

PLAN OF THE GROUND FLOOR.



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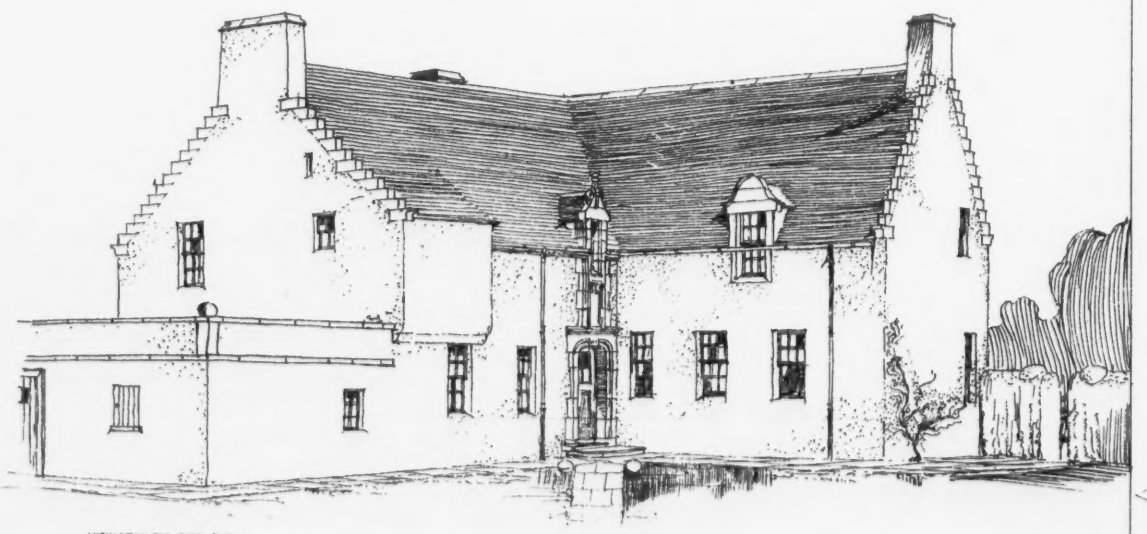
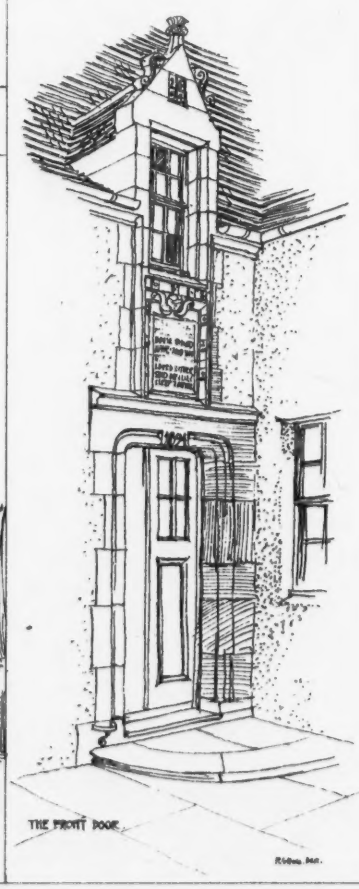
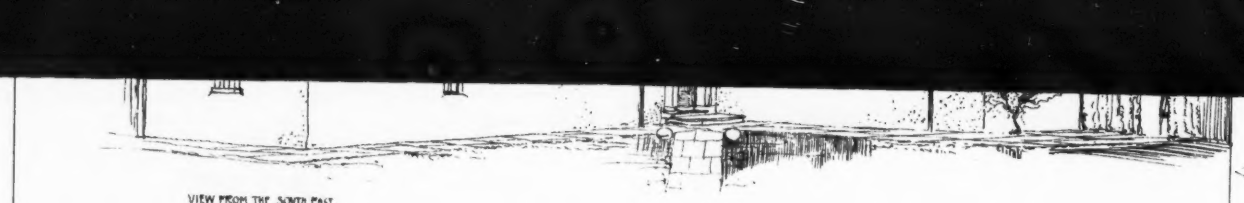


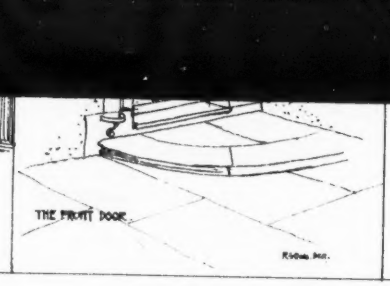
VIEW FROM THE SOUTH EAST.



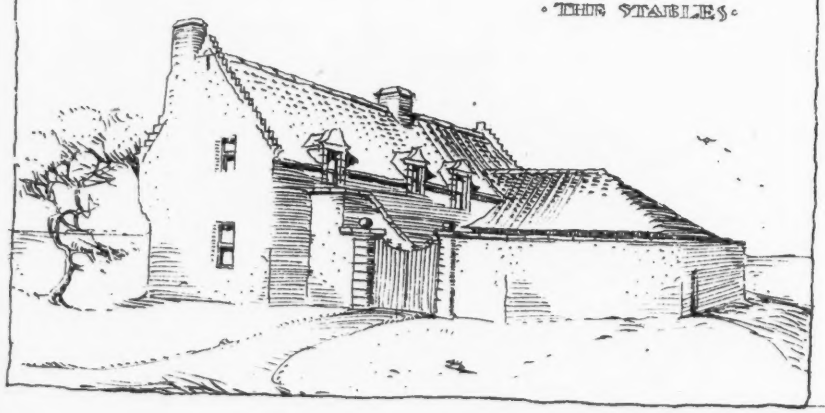
THE FRONT DOOR.



VIEW FROM THE SOUTH EAST.



THE FRONT DOOR.



THE STABLES.

A HOUSE at NORTH BERWICK

FOR

The Honble: Lord Trayner

R. S. Lorimer Archt
49 Queen Street Edinr

GROUND FLOOR PLAN.

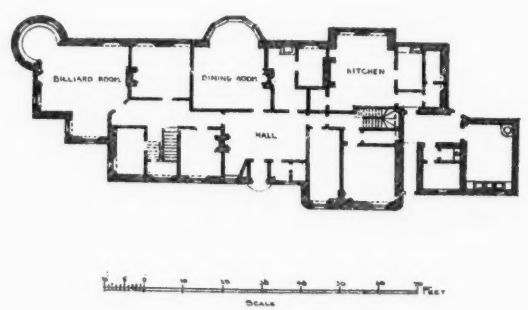
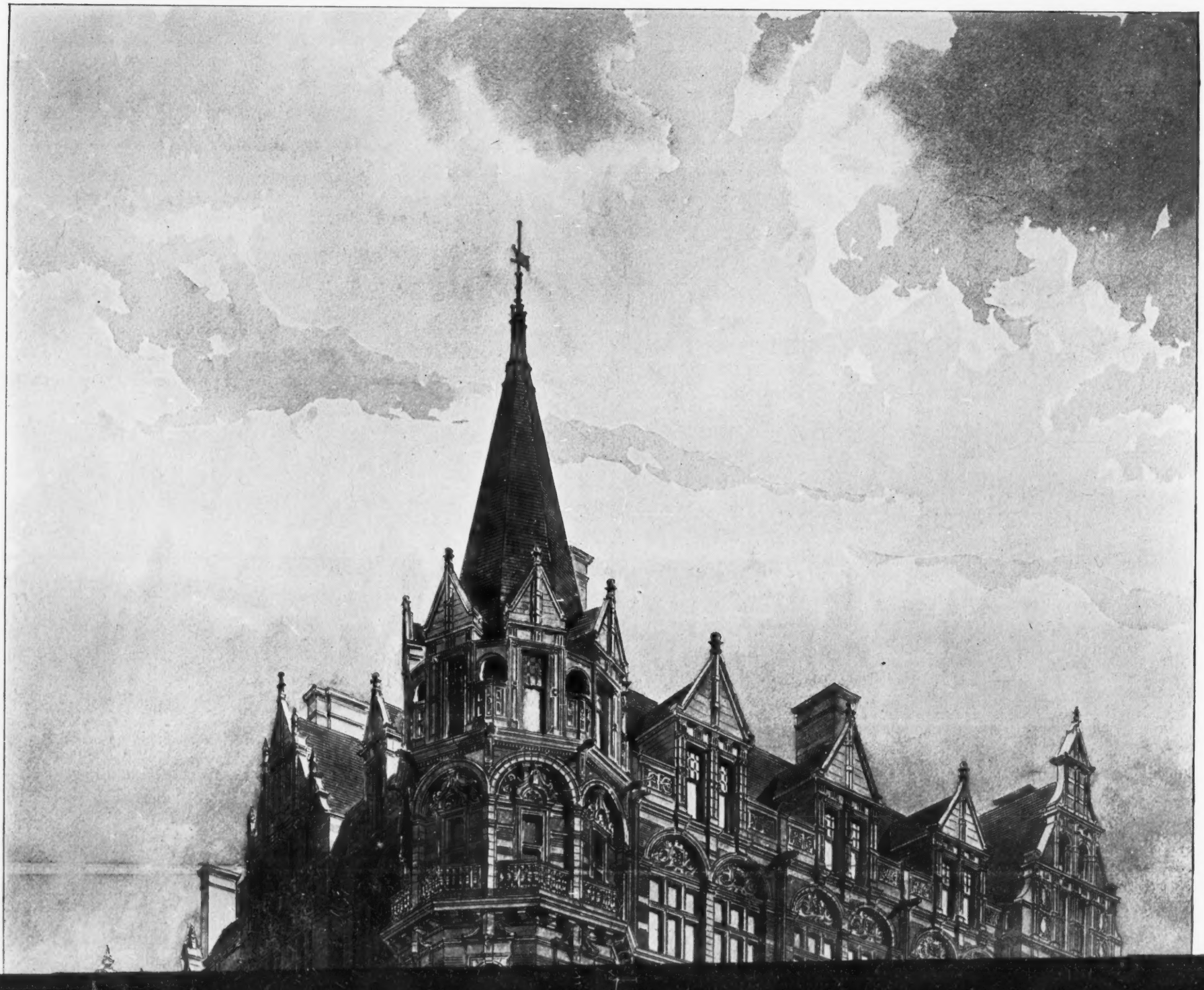
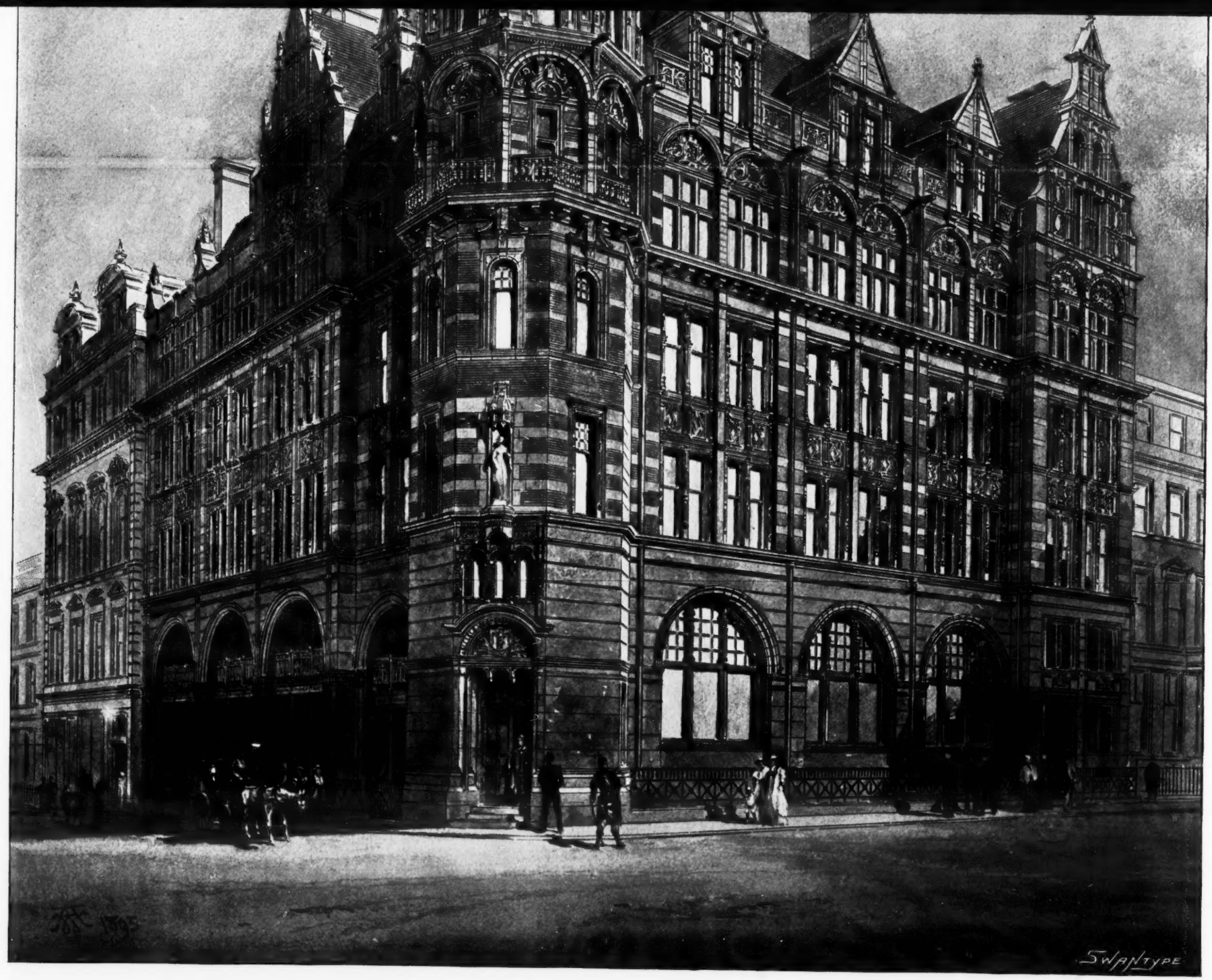


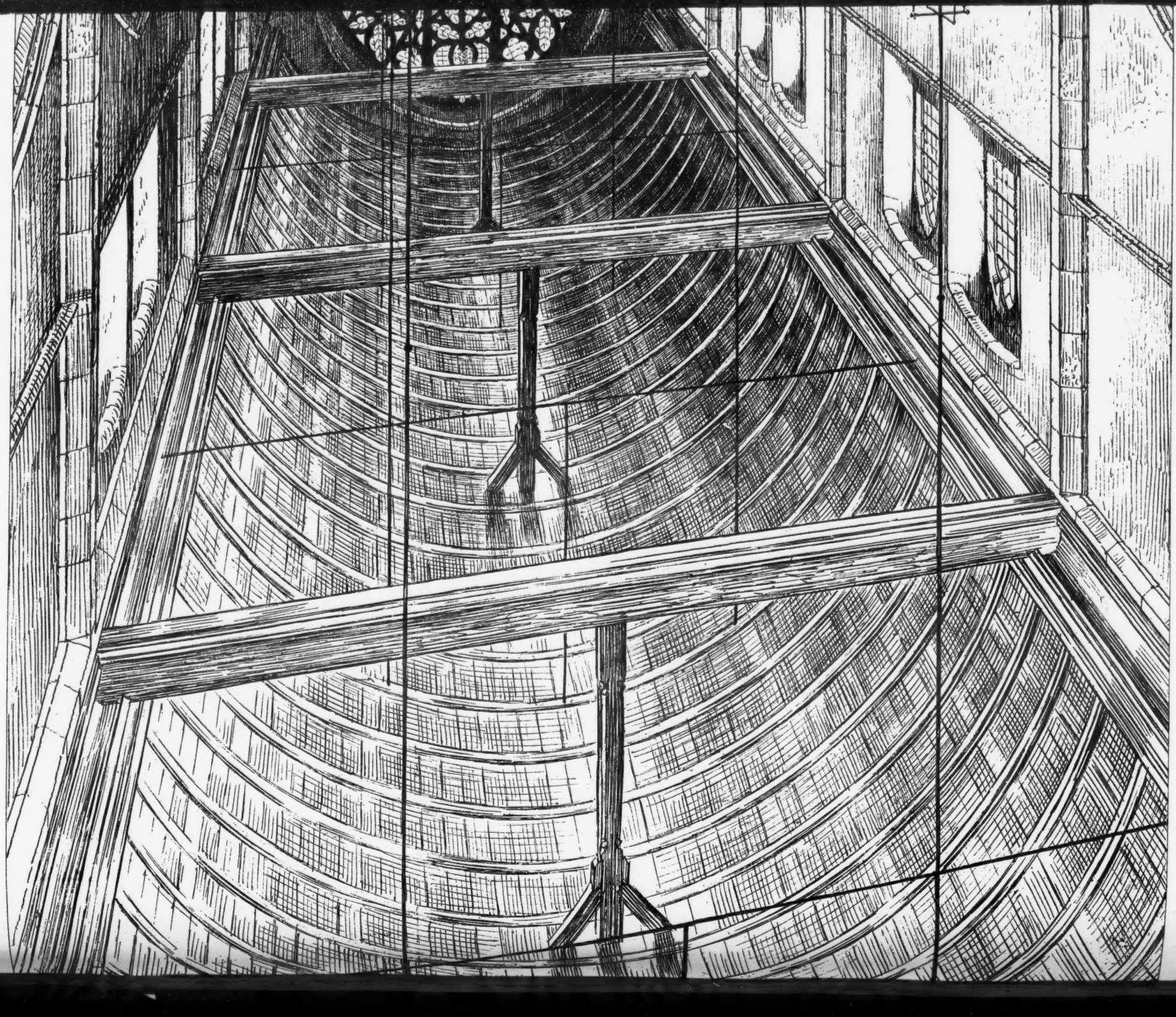
PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

MODERN SCOTTISH HOUSES BUILT IN LOCAL STYLE.—Mr. R. S. Lorimer, A.R.I.B.A., Architect.





THE PRUDENTIAL ASSURANCE COMPANY'S OFFICES, EDINBURGH.—Mr. Alfred Waterhouse, R.A., Architect.



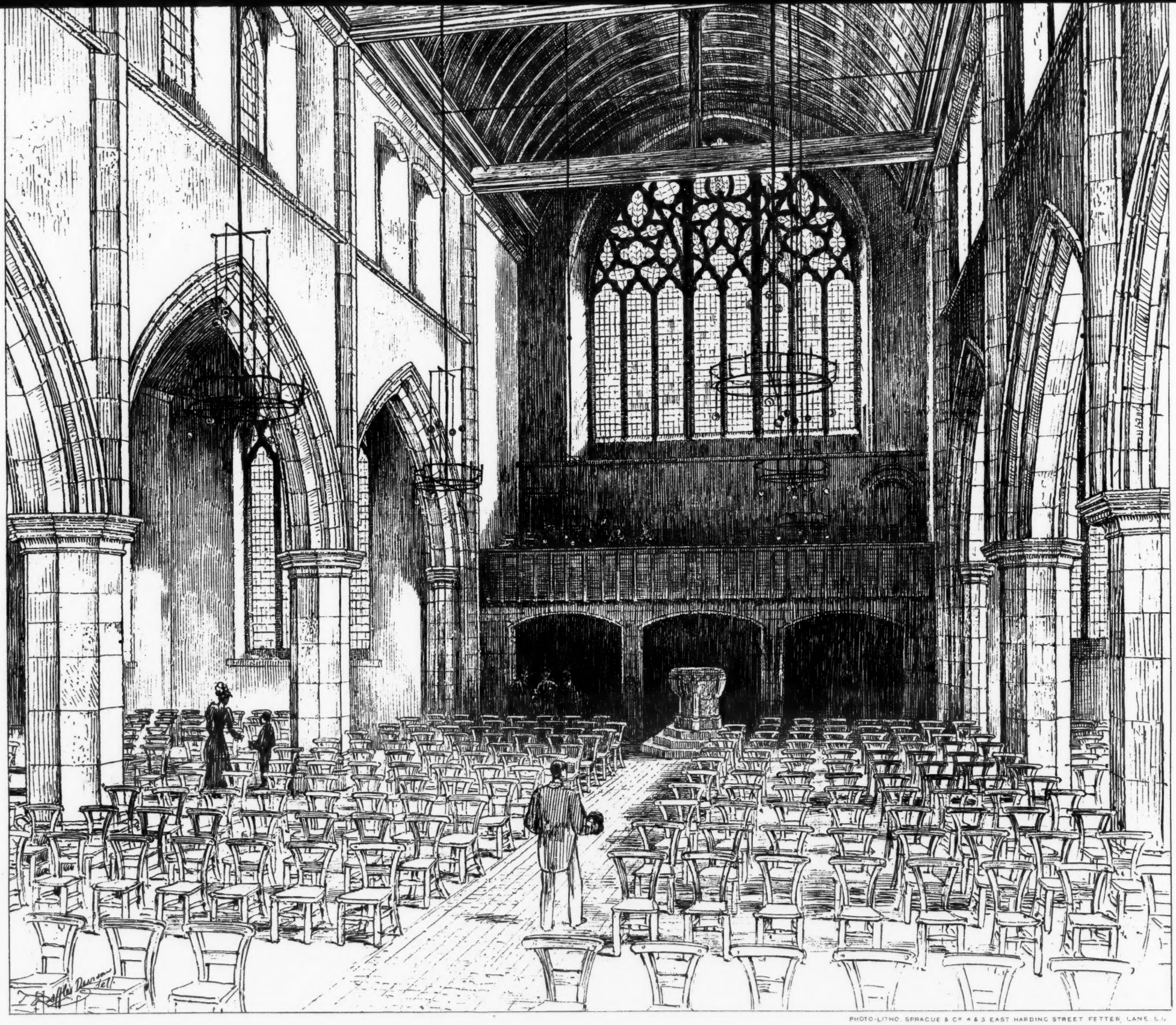
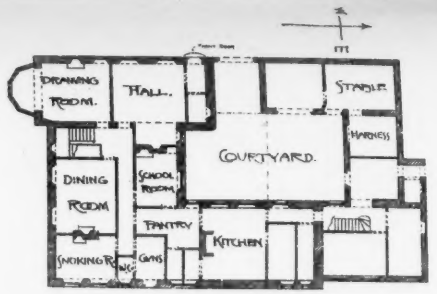


PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

INTERIOR, ST. SWITHIN'S CHURCH, LEWISHAM.—Mr. Ernest Newton, Architect.

FROM THE SOUTH-EAST.

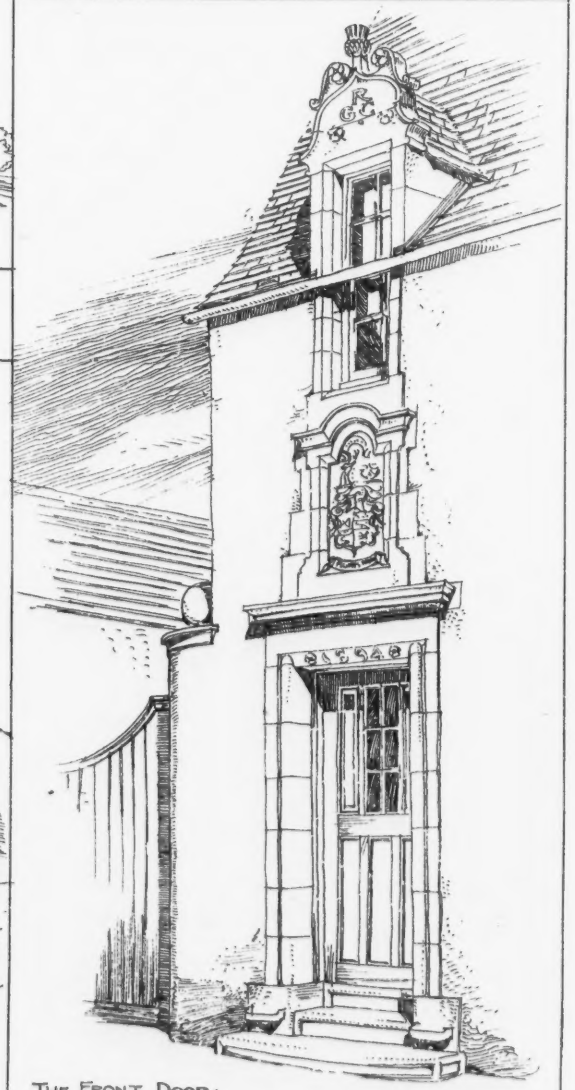


PLAN OF THE GROUND FLOOR.

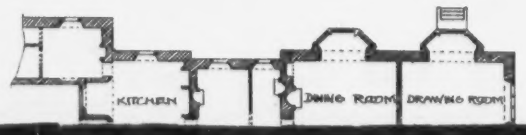
STRONACHULLIN · ARGYLLSHIRE.

FOR R·G·GRAHAM·CAMPBELL·ESQ. OF SHIRVAN·
R·S·LORIMER· ARCHITECT· 49· QUEEN·STREET· EDINBURGH·

FROM THE SOUTH-WEST·



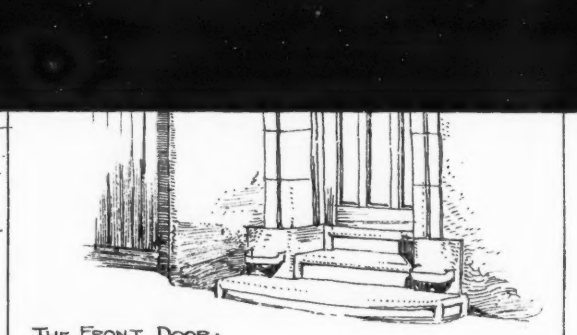
THE FRONT DOOR·



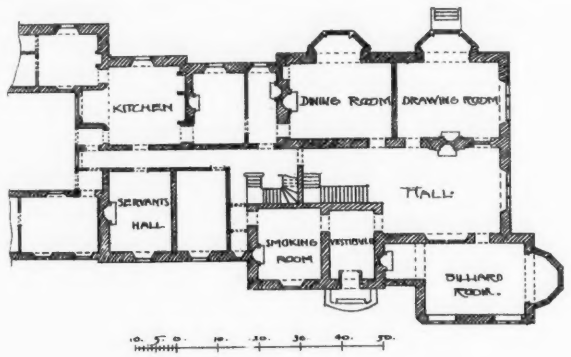
ELLARY·ARGYLLSHIRE.

R·S·LORIMER·ARCHT

FROM THE SOUTH-WEST.



THE FRONT DOOR.



PLAN OF THE GROUND FLOOR.

ELLARY · ARGYLLSHIRE.

FOR · J · FOX · TARRATT · ESQ^RE. · RESTORATION · AFTER · FIRE · AND · ADDITIONS.

R · S · LORIMER · ARCH^T.
49 QUEEN · STREET ·
EDINBURGH.

PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

MODERN SCOTTISH HOUSES BUILT IN LOCAL STYLE.—Mr. R. S. Lorimer, A.R.I.B.A., Architect.